CALIFORNIA ENERGY COMMISSION
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SACRAMENTO, CA 95814-5512

April 23, 2003

TO: Robert Pernell, Commissioner and Committee Presiding Member
Arthur H. Rosenfeld, Commissioner and Committee Associate Member
Garret Shean, Hearing Officer

SUBJECT: COSUMNES POWER PLANT PROJECT (01-AFC-19) - FINAL STAFF ASSESSMENT PART 3

On February 11 and 28, 2003, California Energy Commission staff filed the Final Staff Assessment Part 1 (FSA Part 1) and Part 2 (FSA Part 2) for the Cosumnes Power Plant project (CPP), respectively. The FSA Part 1 included all subject areas except for Alternatives, Biological Resources, and Water and Soil Resources. The FSA Part 2 included staff's Water and Soil Resources assessment. The enclosed document contains the third and final part of the FSA, the Biological Resources and Alternatives assessments. FSA Part 3 also includes the declarations and resumes for the staff that prepared the assessments.

Overview of Staff's Conclusions and Recommendations for FSA Part 3

Alternatives

Staff analyzed three alternative sites at which a 500 or 1,000 MW power plant could be built. Staff also analyzed a number of generation technology alternatives as well as the no project alternative. Overall, the three alternative sites offer some advantages and some disadvantages when compared to the proposed project. However, none of the three alternative sites offers a clear advantage over the CPP project. All may result in significant impacts of their own. Only the no project alternative would result in no impacts; however, none of the project objectives would be met.

Biological Resources

Staff has analyzed the proposed project's impacts on biological resources and has determined that unless properly mitigated, the project would result in significant impacts. The applicant and staff have proposed a number of mitigation measures which would mitigate the project's impacts on biological resources. However, before staff can conclude that the proposed mitigation measures would fully mitigate all impacts to biological resources, the applicant must provide the following items to staff 10 days prior to the Energy Commission's evidentiary hearings (to allow staff and other parties adequate time for review):

1. A management plan for the 19.7 acres of preserved vernal pools at a USFWS-approved mitigation bank or for the 29.5 acres of preserved vernal pools located on SMUD-owned property and off-site mitigation area (non-bank). The management plan should include, but is not limited to: the identification of the specific acres proposed for mitigation; the restoration entity; the management entity (a signed confirmation letter from the management entity); proposed language for a conservation easement; and a Property Analysis Record (PAR) to determine the sum of money required to be placed in a mitigation endowment fund for preserved vernal pools on SMUD-owned property, if necessary.

2. A management plan for the 3.0 acres of created vernal pools at a USFWS-approved mitigation bank or for the 5.9 acres of created vernal pools located on the 70-acre SMUD-owned property (non-bank). The management plan should include, but is not limited to: the identification of the specific acres proposed for mitigation; the restoration entity; the management entity (a signed confirmation letter from the management entity); a timeline when creation would be complete; proposed language for a conservation easement; and a Property Analysis Record (PAR) to determine the sum of money required to be placed in a mitigation endowment fund for created vernal pools on SMUD-owned property, if necessary.

3. A management plan for 41.5 acres of giant garter snake (GGS) habitat at a USFWS-approved mitigation bank or other USFWS-approved area. The management plan should include, but is not limited to: identification of the specific acres proposed for mitigation; the restoration entity (if required); the management entity (a signed confirmation letter from the management entity); the timeline when construction would be complete; proposed language for a conservation easement; and a Property Analysis Record (PAR) to determine the sum of money required to be placed in a mitigation endowment fund for GGS if habitat is not at a mitigation bank.

4. Proposed language for a conservation easement of 53.9 acres at a California Department of Fish and Game-approved mitigation bank or on SMUD-owned property for Swainson's hawk.

5. A revised Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) that incorporates all of the updated mitigation measures that SMUD proposed in the USFWS-accepted Biological Assessment, the Wetland Delineation Report, and Energy Commission staff's recommendations in the FSA.

Additionally, if the project is approved, the Energy Commission and USFWS must approve the management plans, and the Energy Commission must approve the

BRMIMP, prior to any construction activity. The conservation easement for the GGS area and for the preserved and created vernal pool areas on SMUD-owned property must also be in place and/or the mitigation credits must be purchased prior to any construction activity. Additionally, staff would like to note that a number of biological resource-related permits and approvals by their respective agencies are required prior to construction, such as a Biological Opinion; Clean Water Act Section 404 Permit; Clean Water Act Section 401 Permit; Fish and Game Code, Section 2081; and Fish and Game Code, Section 1600 - Streambed Alteration Agreement.

Summary of Final Staff Assessment (Parts 1, 2, and 3)

Energy Commission staff has now completed its analyses of the CPP project. Staff concludes that for all technical areas (except for Biological Resources), that with staff's recommended conditions of certification, the construction and operation of the CPP would be in compliance with all laws, ordinances, regulations, and standards (LORS) and would not create a significant impact to the environment, public health and safety, or the electric transmission grid. For Biological Resources, if SMUD provides the management plans and BRMIMP as described above, then staff would likely conclude that with staff's proposed conditions of certification, the CPP would be in compliance with all LORS and would not create a significant impact to the environment.

Staff has analyzed both phases of the project to the fullest extent allowed by the information that is currently available. Staff's proposed conditions of certification appear sufficient at this time for Phase 2 except in the areas of Air Quality, Transmission System Engineering, and Water and Soil Resources (see the FSA Part 1 and 2 for staff's analysis). Additionally, as stated in the FSA Part 2, SMUD has recently agreed to use reclaimed water for power plant cooling for Phase 2, which staff has not yet fully analyzed. Staff would need to analyze the reclaimed water pipeline impacts for all technical areas if and when SMUD files an application for Phase 2.

Therefore, should Phase 1 of the project be approved, staff recommends that the Energy Commission make the following finding in its final decision:

> Provided that the project owner submits an application within 3 years of the effective date of a Commission decision to approve Phase 1 of the project, the Commission's review of the application shall be limited to Air Quality, Water and Soil Resources, Transmission System Engineering, and impacts associated with the use of recycled water for cooling unless any of the circumstances identified in CEQA Guidelines (Title 14, California Code of Regulations, section 15162(a)(1) - (3)) regarding substantial changes or new information have occurred, or there have been changes to applicable laws. The Commission shall issue its findings and render a final decision on Phase 2 within 12 months after the supplemental application is deemed complete or, if the provisions of Title 20, California Code of

Regulations, section 2021 et seq. for expedited permitting are met, within 6 months after the application is deemed complete provided that Pub. Resources Code 25550 et seq. has been extended. If an application is not filed within 3 years, a new AFC will be required for Phase 2.

Sincerely,

--Original Signed--

PAUL RICHINS, Jr.
Energy Facilities Licensing Program Manager

Enclosures: Final Staff Assessment Part 3 – Biological Resources and Alternatives Assessments
Staff Declarations and Resumes

cc: POS

BIOLOGICAL RESOURCES

Testimony of Melinda Dorin

INTRODUCTION

This section provides staff's analysis of potential impacts to biological resources from Sacramento Municipal Utility District's (SMUD) proposal for the construction and operation of the Cosumnes Power Plant (CPP) project. SMUD has proposed the CPP project in two phases. Staff included a description of Phase 2 of the project as described in the AFC (SMUD 2001a), although SMUD has not determined if and when construction would begin. The analysis addresses impacts to federally- and state-listed species, species of special concern, wetlands, and other areas of critical biological concern. Information regarding the affected biotic community and the potential environmental impacts associated with the construction and operation of the proposed project is presented in the document. Where necessary, mitigation plans and compensation measures are specified for Phase 1 to reduce potential impacts to less than significant levels. This document also determines compliance with applicable laws, ordinances, regulations, and standards (LORS), and specifies conditions of certification. Staff has not proposed mitigation, determined LORS compliance, or specified conditions of certification for Phase 2.

This analysis is based, in part, on information provided as of April 7, 2003. Documents referenced include SMUD's Application for Certification (AFC), Responses to Data Requests, Informal Data Responses, AFC Supplements, the wetland delineation report, and Biological Assessment (see **Reference** section for complete references). Staff also conducted site visits and had additional correspondence and discussions with the California Department of Fish and Game (CDFG), U.S. Fish and Wildlife Service (USFWS), the National Marine Fisheries Service (NMFS), and the U.S. Army Corps of Engineers (ACOE). Information was also gathered at the January 24, 2002 and June 12, 2002 data response workshops and the August 26, 2002 and September 6, 2002 Preliminary Staff Assessment workshops.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

FEDERAL

- **Clean Water Act of 1977**
  Title 33, United States Code, section 404 et seq., prohibit the discharge of dredged or fill material into the waters of the United States without a permit.
- **Endangered Species Act of 1973**
  Title 16, United States Code, section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.
- **Migratory Bird Treaty Act**
  Title 16, United States Code, sections 703-712, prohibit the take of migratory birds, including their eggs.

- **Bald and Golden Eagle Protection Act**
  Title 16, United States Code, section 668, protects bald and golden eagles from possession, selling, purchase, barter, offers to sell, purchase or barter, transport, export or import, at any time or in any manner, alive or dead, or any part, nest, or egg thereof of the foregoing eagles.
- **Magnuson-Stevens Fishery Conservation and Management Act as Amended in 1996**
  Title 16 United States Code, section 1855(b), 50 CFR 600.905 – 930, define Essential Fish Habitat (EFH) for federally-managed fish species as "those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." This law requires consultation by a federal agency with NMFS when a proposed action may adversely affect EFH.

STATE

- **California Environmental Quality Act (CEQA)**
  Public Resources Code section 21000 et seq. mandate protection of California's environment and natural resources to develop and maintain a high-quality environment now and in the future. Specific goals of CEQA are for California's public agencies to: 1) identify the significant environmental effects of their actions; and, either 2) avoid those significant environmental effects, where feasible; or 3) mitigate those significant environmental effects, where feasible.
- **Fish & Game Code Sections Protecting Biological Resources**

  California Endangered Species Act of 1984: Fish and Game Code section 2050 et seq. protect California's rare, threatened, and endangered species.

  Nest or Eggs: Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs of any bird.

  Birds of Prey or Eggs: Fish and Game Code section 3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

  Migratory Birds: Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory non-game bird as designated in the Migratory Bird Treaty Act or any part of such migratory non-game bird.

  Fully Protected Species: Fish and Game Code sections 3511, 4700, 5050, 5515 prohibit take of animals, or their habitat, that are classified as "Fully Protected" in California.

  Non-game Birds: Fish and Game Code section 3800 et seq. protect all non-game birds by making it unlawful to take non-game birds or parts of a bird unless otherwise provided in this Code's section.

  Significant Natural Areas: Fish and Game Code section 1930 et seq. designate certain areas such as refuges, natural sloughs, riparian areas, and vernal pools as significant wildlife habitat.

Native Plant Protection Act of 1977: Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

Streambed Alteration Agreement: Fish and Game Code section 1600, requires evaluation of project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions, and other disturbances.

- **California Code of Regulations – Endangered Species**
  Title 14, sections 670.2 and 670.5 list animals of California designated as rare, threatened, or endangered.

- **Regional Water Quality Control Board Certification**
  Federal Clean Water Act section 401 requires certifications from the state for discharge of dredge or fill material into Waters of the United States. The Regional Board provides certification after reviewing the U.S. Army Corp of Engineers permit.

LOCAL

- **Tree Preservation Ordinance**
  Sacramento County Code (SCC 480 § 1, 1981) Chapter 19.12 requires preservation and protection of native oak trees, as well as giving discretionary authority to the county to protect other tree species. It establishes standards and measures for the preservation and protection of trees.

- **Sacramento County General Plan (1993)**
  The Conservation Element contains specific objectives to preserve water quality and soils that have benefits to biological resources. It also contains specific policies and goals for preserving marsh and riparian areas, vernal pools, ephemeral wetlands, urban streams, trees, rare and endangered species, fisheries, and for promoting resource conservation areas. Human access to critical habitat should be controlled. County biological resource ordinances that may apply to the CPP are provided below.

  Conservation Ordinances 60-73 require that marsh and riparian habitat are protected and that there is a 10 percent increase in marsh and riparian woodland habitat by 2010.

  Conservation Ordinances 78-102 require the preservation and enhancement of self sustaining vernal pool habitats. The goal is to ensure no net loss of vernal pool acreage, or functional value, and provide on-site or off-site mitigation. Impacts to vernal pools should be mitigated within Sacramento County. Mitigation should include an endowment account for management in perpetuity.

  Conservation Ordinances 107-116 requires preservation of stream channels. When modifying or realigning them retain meandering characteristics and topographical diversity. Requires maintaining minimum water flow to protect and enhance fish habitats, water quality, riparian vegetation and ground water recharge. The County encourages revegetation with native plants and avoidance of nonindigenous species.

Conservation Ordinances 130 and 131 protect and preserve oaks and other native trees excluding cottonwoods. Native trees other than oaks, which cannot be protected, shall be replaced with in-kind species in accordance with established tree planting specifications.

SETTING

REGIONAL

Prior to about 1850, there were many diverse habitat types in the Central Valley, including freshwater marshes, grasslands, riparian woodlands, vernal pools and foothill woodlands. Humans have impacted all of these habitats. Farming, grazing, the introduction of exotic weed species, and urban and suburban development have reduced these habitats to remnants.

The proposed CPP site is in the southern portion of Sacramento County, north of San Joaquin County and west of Amador County. The City of Sacramento is located about 23 miles northwest of the project site and the City of Elk Grove is located about 14 miles northwest of the project site. The foothills to the east of the project site rise to the western slope of the Sierra Nevada Mountains. There are many reservoirs and lakes in the foothills that are used for recreational camping, fishing, boating, hiking, and other outdoor activities. The closest Class I Wilderness Areas are the Mokelumne and Carson-Iceberg Wilderness Areas, which are located about 55 miles east of the project site. Designated by the Wilderness Protection Act of 1964, Class I federal lands include areas such as national parks, national wilderness areas, and national monuments. These areas are granted special air quality protections under Section 162(a) of the Federal Clean Air Act. For a discussion of air quality impacts, see the **Air Quality** section of the Final Staff Assessment.

The Sacramento River runs from north to south through Sacramento County, about 22 miles west of the proposed project site. The American River joins the Sacramento River in the City of Sacramento approximately 26 miles north of the project site. There are several creeks and rivers in the region that begin in the Sierra Nevada Mountains, or the foothills of the Sierra Nevada, and flow westward to the Sacramento–San Joaquin Delta. The Cosumnes River, Badger Creek, Laguna Creek, Dry Creek, and the Mokelumne River are located south of the American River. The Cosumnes River, located about 14 miles east northeast of the CPP site, is the last major remaining undammed river on the western slope of the Sierra Nevada, and flows 80 miles to the Sacramento-San Joaquin Delta.

There are also several preserves, parks, and recreation areas in the region of the proposed CPP. The Nature Conservancy (TNC) and the CDFG own the Cosumnes River Preserve, which is located about 15 miles west of the project site. Since TNC first purchased 85 acres in 1984, the Preserve has grown to over 37,042 acres and provides essential habitat to many species that frequent the Central Valley of California. Tens of thousands of Pacific Flyway birds winter at the Preserve. Among those is more than half of the Central Valley's population of wintering greater sandhill cranes (for scientific names of special status species see **Biological Resources Table 1**). More than 200

species of birds have been recorded on and around the Preserve. The Preserve is also home to many mammals, reptiles, amphibians, and fish. The Preserve supports many different habitats such as crops of organic rice, alfalfa, wheat, and corn, seasonal and permanent freshwater wetlands, riparian woodland, blue oak woodland, vernal pools, and shallow water habitat (TNC 2002). Also owned by the TNC is Howard Ranch, located east of the Rancho Seco Reservoir. Howard Ranch is a vernal pool preserve that also has a known population of California tiger salamanders (CDFG 2003).

The Sacramento Regional County Sanitation District Bufferlands is located at the northern end of the proposed gas pipeline and approximately 26 miles from the proposed power plant site. The Bufferlands were established to serve as a 2,500-acre buffer between the regional wastewater treatment facility and nearby residences and business. The area is managed for wildlife and fisheries habitat with ongoing habitat enhancement. There are wetlands, vernal pools, grasslands, and riparian habitats that are home to many species of animals. The area has also been used as a mitigation site for giant garter snakes, Western burrowing owls (burrowing owls), and wetlands. The 550-acre Upper Beach Lake wetlands are part of the Bufferlands and are adjacent to the Stone Lakes National Wildlife Refuge. More information including species lists can be found at http://www.srcsd.com/buffer.html. Banding of burrowing owls has been initiated over the past year to give the Bufferlands managers more information on the number of burrowing owls using the area. Other projects include a five-year wetland demonstration project, planting of native trees to restore the riparian corridors, encouraging natural tree recruitment through water management in Morrison and Laguna creeks, and restoring native perennial grasslands. Great horned owls (*Bubo virginianus*), Swainson's hawks, and white-tailed kites have recently nested there.

Laguna Stone Lake Preserve is located south of Elk Grove Boulevard and west of the Union Pacific railroad tracks. It is held under conservation easement to mitigate for previous vernal pool losses from residential development. The property supports created vernal pools that contain dwarf downingia, legenere, vernal pool fairy shrimp, and vernal pool tadpole shrimp (Whitney, pers. com.). The area is about 18 miles from the project site and 500 feet from the gas pipeline corridor.

The Valensin Preserve is located about nine miles northwest of the site and is part of the Cosumnes River Preserve. The North Fork of Badger Creek is a tributary to Badger Creek, and both run through the Valensin Preserve. Badger Creek is a tributary to the Cosumnes River. This area consists of vernal pools, seasonal and permanent freshwater wetlands, riparian woodland, and vernal pools. The California Natural Diversity Database (CNDDB) lists it as having Great Valley riparian oak habitat. Badger Creek also provides habitat for the federally- and state-listed giant garter snake.

About nine miles to the south east of the proposed project is Camanche Reservoir, located on the Mokelumne River. The Mokelumne River provides habitat to the spring-run Chinook salmon and central valley steelhead, as well as a riparian corridor for other species such as nesting birds, including Swainson's hawks. There is a fish hatchery at Camanche Dam that is owned by East Bay Municipal Utility District and operated by CDFG.

Rancho Seco Recreation Area includes Rancho Seco Reservoir and the Amanda Blake Memorial Wildlife Refuge. Located about 2 miles east of the CPP site the Rancho Seco Recreation Area is the closest park. The 400-acre recreation area, owned and operated by SMUD, has picnic tables and fishing access on Rancho Seco Reservoir. SMUD stocks the 160-acre reservoir with rainbow trout and other sport-fishing species such as bass *(Micropterus sp.),* crappie *(Pomoxis nigromaculatus),* catfish (*Ictalurus sp.),* and bluegill *(Lepomis macrochirus).* Boating, sailing, windsurfing, swimming, camping, and bird watching are also popular activities. There are large trees around the reservoir, which can provide nesting habitat for Swainson's hawks and other bird species including white-tailed kites and red-tailed hawks (*Buteo jamaicensis*). Rancho Seco Reservoir receives its water from the American River, via the Folsom South Canal, a canal maintained and operated by the U.S. Bureau of Reclamation (USBR). Exotic animals can be seen at the 75-acre Amanda Blake Memorial Wildlife Refuge. The refuge is home to animals that have been rescued by the Performing Animal Welfare Society (PAWS), which leases the property from SMUD. Information regarding Rancho Seco Park and the Amanda Blake Wildlife Refuge can be found at http://www.smud.org/community/ranchoseco.html.

Recovery Plans and Critical Habitat

The Federal Endangered Species Act defines critical habitat as the specific areas within the geographic range occupied by a species that have the physical or biological features essential to the conservation of the species and that may require special management considerations or protection. The Act also includes specific areas outside the geographic area occupied by a species if those areas are determined by the USFWS to be essential for the conservation of the species. Conservation is defined as all methods and procedures necessary to bring an endangered or threatened species to the point at which it can be de-listed.

Salmon and Steelhead Evolutionarily Significant Units (ESUs)

The NMFS has classified salmon into Evolutionarily Significant Units (ESU). An ESU is a distinctive group of Pacific salmon, steelhead, or sea-run cutthroat trout. Factors used in determining an ESU includes spatial, temporal, and genetic isolation, maturation rates and other life history traits. Central Valley spring and fall/late-fall run Chinook salmon, Sacramento Valley winter-run Chinook salmon, and Central Valley steelhead have each been classified into an ESU. Spring and winter-run Chinook salmon and steelhead use the Sacramento River, which has been designated as critical habitat by NMFS (NMFS 2000).

Essential Fish Habitat (EFH)

Federal agencies that authorize, fund, or undertake projects that may adversely affect EFH must consult with NMFS on all actions or proposed actions. EFH is defined as those areas that are necessary to fish for their basic life functions including spawning, breeding, feeding, or growth to maturity. There is a Pacific Coast Salmon Plan that outlines EFH for Central Valley Chinook salmon and identifies activities that could potentially harm EFH as well as conservation recommendations. The plan is available electronically at http://swr.ucsd.edu/ (NMFS 2002). The Lower American River and the Cosumnes River are identified as EFH for fall-run Chinook salmon.

Central Valley Spring-run Chinook Salmon Critical Habitat

Designated critical habitat for the Sacramento River winter-run Chinook salmon ESU includes all river reaches accessible to listed Chinook salmon in the Sacramento River and its tributaries. It includes the Lower American River to Nimbus Dam. Also included are the adjacent riparian areas as well as river reaches and estuarine habitats of the Sacramento-San Joaquin Delta west to the Golden Gate Bridge and San Francisco Bay Bridge (NMFS 2000). The previously defined areas of Central Valley spring-run Chinook salmon critical habitat were withdrawn in April 2002, and new critical habitat is being developed.

Designated critical habitat for the Central Valley steelhead ESU includes all river reaches accessible to listed steelhead in the Sacramento and San Joaquin rivers and all of their tributaries. Also included are the adjacent riparian areas as well as river reaches and estuarine habitats west to the Golden Gate Bridge and the San Francisco Bay Bridge (NMFS 2000).

Giant Garter Snake

The *Draft Recovery Plan for the Giant Garter Snake* (USFWS 1999a) outlines the species life history, habitat needs, distribution throughout the Central Valley of California, and the recovery strategy for the species. The ultimate goal of the Draft Recovery Plan is to de-list the giant garter snake from the Federal Endangered Species List when the Recovery Criteria are met. Loss of habitat remains the greatest threat, but road kills may also be a significant mortality factor in areas where roads are in close proximity to giant garter snake populations. Protection of existing habitat is one of the key components of the recovery strategy for this species. Because of the loss of natural habitat, giant garter snakes are often found in agricultural wetlands, drainage canals, managed marshes, and adjacent uplands in the Sacramento Valley. Giant garter snakes are present in the Cosumnes River Preserve as well as neighboring areas that have appropriate habitat. The USFWS recognizes the Badger Creek/Willow Creek area as having one of the remaining 13 extant populations and has identified it as a critical habitat unit (USFWS 1999a). Giant garter snake habitat has been identified by the USFWS from the northern end of the gas pipeline within the Bufferlands to Folsom South Canal. There is no giant garter snake habitat at the power plant site.

Vernal Pool Invertebrates and Plants Proposed Critical Habitat

The USFWS has proposed critical habitat for 11 vernal pool plants and four vernal pool crustaceans (Federal Register Vol. 67, No. 185), including vernal pool fairy shrimp, vernal pool tadpole shrimp, slender orcutt grass, and Sacramento orcutt grass. All have proposed critical habitat within the vicinity of the proposed CPP. Proposed critical habitat units are located east of the Rancho Seco Nuclear Power Plant. Landscape that supports a vernal pool complex is typically grassland, with areas of topography or relief, and an impermeable clay or hard pan layer that form the pools. The pools may be fed or connected by low drainage pathways called swales. Because of the root restricting subsurface layer and sometime alkaline soils, trees are relatively rare in most vernal pool complexes. Upland areas associated with vernal pools are also an important source of nutrients to vernal pool organisms. Section 7 of the Endangered Species Act

requires conferences on Federal actions that are likely to result in the destruction or adverse modification of proposed critical habitat.

SITE VICINITY AND DESCRIPTION

In the vicinity of the project site and the related linear facilities, there are several different habitat types present including annual grasslands, vernal pools, permanent and seasonal wetlands, and riparian woodlands. Vineyards encompass approximately 550 acres to the west and north of the proposed site and annual grassland that is actively grazed is located to the south and east (WAC 1999).

Thirty-seven stream crossings have been identified by SMUD in their Streambed Alteration Agreement Application (SAA) to the DFG (SMUD 2002ak). Of the 37 stream crossings identified, SMUD is proposing to use Horizontal Directional Drill (HDD) technology to cross the Cosumnes River, Badger Creek, the Badger Creek backwater lake, Laguna Creek, and a slough on Franklin Boulevard. The other waterways to be crossed or altered are identified as either drainage or irrigation ditches or ephemeral drainages. Dry season trenching would be used for crossing the other 32 waterways during gas pipeline construction. The SAA application is being updated to reflect the permanent realignment of the seasonal drainages at the site and construction laydown area (Crowe 2003, pers.com.).

Vernal pools are formed in areas where there has been a formation of a dense claypan or hardpan layer at some depth below the surface. These hardpans are thick enough that rain and surface water cannot seep into the lower soil column. Instead, the water accumulates on the surface. Vernal pools form a microhabitat that is important to many of the endemic plants of California (Holland 1976). Plants such as dwarf downingia, Boggs Lake hedge-hyssop, legenere, pincushion navarretia, slender orcutt grass, and Sacramento orcutt grass are found in vernal pool habitat. Vernal pool plant species were reported in the vernal pools and seasonal swales at the project site, water pipeline corridor, transmission line corridor, and laydown area during spring surveys (SMUD 2002z, Attachment BR-204B). Vernal pools with sensitive species habitat were also identified along the gas pipeline (SMUD 2003j, Figures 5-9 and Table 9).

Vernal pools also provide habitat for the vernal pool invertebrate species such as the federally-listed vernal pool fairy shrimp, midvalley fairy shrimp, California linderiella fairy shrimp, and vernal pool tadpole shrimp. SMUD did not survey for invertebrates because the USFWS assumes their presence in this area of Sacramento County (Ken Fuller, Data Response Workshop January 24, 2002). Known locations of vernal pool invertebrates were identified and submitted with the Biological Assessment (SMUD 2003j, Figures 5-9).

Rare plant surveys were completed in 1993 for the Rancho Seco Master Plan (SMUD 1994). Boggs Lake hedge-hyssop, legenere, and Sacramento orcutt grass were located in the vernal pool complex near the Rancho Seco Reservoir. Rare plant surveys were also completed as part of the wetland delineation for the project, and additional spring surveys were completed in accordance with the CDFG and California Native Plant Society (CNPS) plant survey guidelines in May 2002. No sensitive plant species were observed during surveys (SMUD 2002 3D, Attachment BR-202).

Historical locations of sensitive plants were reported by SMUD (SMUD 2003j, Figures 5-9).

California tiger salamander larvae have been observed east of Rancho Seco in the created vernal pool area (SMUD 2003j, p. 18) and at Howard Ranch (CDFG 2003). These locations are about one mile from the CPP project site, laydown area, water pipeline, transmission line, and construction access road (SMUD 2003j, p. 43).

For the purpose of this analysis, the designation of special-status species includes all federally- and state-listed species, species proposed for listing under the California and Federal Endangered Species acts, federal species of concern, state species of special concern, and plant species designated as rare, threatened, or endangered (List 1B or List 2) by the CNPS Inventory or Rare and Endangered Plants of California (CNPS 2001). **Biological Resources Table 1** is a list of the sensitive plant and animal species and CNDDB natural communities with potential to occur within the project vicinity.

Biological Resources Table 1
Sensitive Species and Natural Communities with Potential to Occur or Are Presumed Present in CPP Project Area

Common Name	Scientific Name	Status*	Location**
Plants			
Dwarf downingia	*Downingia pusilla*	--/--/2	Gas Pipeline
Boggs Lake hedge-hyssop	*Gratiola heterosepala*	--/E/1B	Rancho Seco
Rose mallow	*Hibiscus lasiocarpus*	--/--/2	Gas pipeline
Delta tule pea	*Lathyrus jepsonii var. jepsonii*	FSC/--/1B	Gas pipeline
Legenere	*Legenere limosa*	--/--/1B	Rancho Seco, gas pipeline
Slender orcutt grass	*Orcuttia tenuis*	FT/CE/1B	Rancho Seco
Sacramento orcutt grass	*Orcuttia viscida*	E/E/1B	Rancho Seco
Sanford's arrowhead	*Sagittaria sanfordii*	FSC/--/1B	Gas pipeline
Invertebrates			
Vernal pool fairy shrimp	*Branchinecta lynchi*	FT/--	Gas pipeline, project site
Midvalley fairy shrimp	*Branchinecta mesovallensis*	FSC/--	Gas pipeline, project site
California linderiella fairy shrimp	*Linderiella californica*	FSC/--	Gas pipeline, project site
Vernal pool tadpole shrimp	*Lepidurus packardi*	FE/--	Gas pipeline, project site
Valley elderberry longhorn beetle	*Desmocerus californicus dimorphus*	FT/--	Gas pipeline
Fish			
Central Valley spring-run Chinook salmon (ESU)	*Oncorhynchus tshawytscha*	FT/ST	Gas pipeline, (water use)
Sacramento River winter-run Chinook salmon (ESU)	*Oncorhynchus tshawytscha*	FE/SE	Gas pipeline, (water use)
Fall/late-fall run Chinook salmon (ESU)	*Oncorhynchus tshawytscha*	FC/CSC	Gas pipeline, (water use)
Steelhead-Central Valley ESU	*Oncorhynchus mykiss*	FT/--	Gas pipeline, (water use)
Amphibians			
Western spadefoot toad	*Scaphiopus hammondii*	FSC/CSC	Project site
California tiger salamander	*Ambystoma tigrinum*	FC/CSC	Rancho Seco, gas pipeline,

Common Name	Scientific Name	Status*	Location**
	californiense		project site
Reptiles			
Giant garter snake	*Thamnophis gigas*	FT/ST, CFP	Gas pipeline
Northwestern pond turtle	*Clemmys marmorata marmorata*	FSC/CSC	Gas pipeline, project site
Birds			
Double-crested cormorant	*Phalacrocorax auritus*	--/CSC	Gas pipeline, project site
American Bittern	*Botaurus lentiginosus*	FSC/--	Gas pipeline
White-faced ibis (rookery)	*Plegadis chihi*	FSC/CSC	Gas pipeline
Greater sandhill crane	*Grus canadensis tabida*	--/ST, CFP	Gas pipeline
Trumpeter swan	*Cygnus buccinator*	--/CFP	Gas pipeline
Golden eagle	*Aquila chrysaetos*	--/CSC	5 miles east of Rancho Seco
Bald eagle	*Haliaeetus leucocephalus*	FPD/SE	5 miles east of Rancho Seco
White-tailed kite	*Elanus leucurus*	--/CFP	Gas pipeline, project site, compressor station
Northern harrier (nesting)	*Circus cyaneus*	--/CSC	Gas pipeline, project site, compressor station
Swainson's hawk	*Buteo swainsoni*	--/ ST	Gas pipeline, project site, compressor station
Ferruginous hawk	*Buteo regalis*	FSC/CSC	Gas pipeline, project site, compressor station
Western burrowing owl	*Athene cunicularia hypugea*	FSC/CSC	Gas pipeline, project site, compressor station
Loggerhead shrike	*Lanius ludovicianus*	FSC/CSC	Gas pipeline, project site, compressor station
California horned lark	*Eremophila alpestris actia*	FSC/CSC	Gas pipeline, project site, compressor station
Tricolored blackbird (nesting colony)	*Agelaius tricolor*	FSC/CSC	Gas pipeline, project site, compressor station
Mammals			
Long-legged myotis bat	*Myotis volans*	FSC/--	Gas pipeline
Yuma myotis	*Myotis yumanensis*	FSC/--	Gas pipeline
Small footed myotis bat	*Myotis ciliolabrum*	FSC/--	Gas pipeline
Habitats			
Northern hardpan vernal pool			Gas pipeline, project site
Coastal and valley freshwater marsh			Gas pipeline
Great Valley mixed riparian forest			Gas pipeline
Valley oak woodland			Gas pipeline

* Status Legend (Federal/State/CNPS lists, CNPS list is for plants only):
FE = Federally-listed Endangered; FT = Federally-listed Threatened; FSC = Federal Species of Concern; FPD = Federally proposed (Delisting); FC = Candidate Species for Listing; SE = State-listed Endangered; ST = State-listed Threatened; SR = State-listed Rare; SCE = State candidate (Endangered); SCT = State candidate (Threatened); CSC = California Species of Special Concern; CFP = California Fully-Protected species; 1B = List 1B are CNPS rare or endangered in California and elsewhere; 2 = List 2 are CNPS rare or endangered in California, but more common elsewhere; -- = not listed in that catagory .
**Location is either categorized as the gas pipeline, compressor station, and/or the project site. The project site includes the laydown area, access road, water pipeline, transmission line, and the power plant. Rancho Seco refers to pools east of the Rancho Seco Reservoir.

Source: SMUD 2002z, SMUD 1994, CNDDB 2002, SMUD 2003j

Power Plant Site and Laydown Area

The 30-acre power plant site and the 20-acre laydown area consist of annual grassland with wetlands dispersed throughout the site (SMUD 2002e, Data Response 18; SMUD 2002x, Data Response 206). The laydown area may be used for up to 32 months depending on if and when Phase 2 is constructed (SMUD 2003j, Table 2). All wetlands cataloged in the wetland delineation demonstrated presence of all three wetland indicators (wetland hydrology, hydric soils, and hydrophytic vegetation). The ACOE-verified wetland delineation accounted for 2.50 acres of wetlands within the project site foot print and laydown area, all of which are "waters of the U.S." (jurisdictional) and regulated by the ACOE (SMUD 2003e).

The soil type in the project area is predominately Redding Gravelly Loam (map unit 198). Depressional areas within the map unit are mapped as hydric inclusions on the Sacramento County hydric soil list. Redding soils are described as having mostly convex slopes incised by many shallow drainages and depressions. Water is perched above the claypan for short periods following heavy rains and ponds in inter-mound areas (SMUD 2002x, Appendix C and Attachment BR-206D). SMUD has categorized the wetlands for the project site and construction laydown area into the following types: seasonal wetland, seasonal swale, vernal pool, freshwater and seasonal marsh, Placer tailing, riparian willow scrub, seasonal and perennial creek, seasonal stream, drainage ditch, pond, ponded feature, and open water (SMUD 2003e, Table 1).

The CPP site and construction laydown area have not been leveled and contain many of the natural features present in areas with vernal pools and seasonal swales. A seasonal stream and a seasonal swale cross the construction laydown area. They are diverted under Clay East Road and continue through the proposed project site. There are several wetland features on the site, as well as a mine-tailing pond directly east of the project site that holds water all year. Species that were observed using the area around the mine-tailing pond include the California ground squirrel (*California beechyi*), mallard duck (*Anas platyrhynchos*), and great blue heron (*Ardea herodias*) (Dorin, pers. obs.). SMUD completed a survey of the mine tailing pond for California tiger salamander presence, and found species such as Pacific tree frogs (*Hyla regilla*), bullfrogs (*Rana catesbeiana*), and introduced Louisiana red swamp crayfish (*Procambarus clarkii*) (SMUD 2002y). California tiger salamanders were not observed during the surveys. There are also several large trees around the pond that could provide nesting and resting habitat for bird species.

Clay Creek, which crosses north of the proposed plant site, drains to Hadselville Creek west of the site. Hadselville Creek is a tributary to Laguna Creek, which is a tributary to the Cosumnes River. There are also several large degraded pools located between the proposed project site and the existing Rancho Seco Nuclear Facility site that were excavated during the construction of the Rancho Seco Nuclear Facility. There is evidence that they were used to recapture concrete wash water and the soils may potentially contain chemicals (SMUD 2002e, Data Response 18; SMUD 2003j, p.40).

The annual grasslands on the CPP project site and laydown area provide suitable foraging and nesting habitat for a variety of bird species. There is a historical record of a Swainson's hawk nest within 5 miles of the CPP project site and laydown area (SMUD

2002aj, Tiles 5 and 6 of 6). There was also an active nest in the spring of 2002 on Borden Road about a mile and a half east of the intersection with Clay Station Road (Holt, pers. com). This nest location is about 3 miles from the project site and laydown area. A Swainson's hawk and a loggerhead shrike were also seen foraging at the site during special status species surveys (SMUD 2002e, Attachment BR-17). A red-tailed hawk was nesting in an existing transmission line tower on the west side of the project site (SMUD 2002z, Attachment BR204B). A golden eagle was recorded about 5 miles east of the CPP project site in 1992 (CNDDB records, July 2002). There are multiple CNDDB records for tricolored blackbirds and they were also seen foraging over the CPP site and laydown area during surveys. Protocol level surveys for burrowing owls were conducted on the project site. Burrowing owls were not seen (SMUD 2002z, Attachment BR204B), but there are sufficient small mammal holes that could provide potential burrow sites. Burrowing owl sign (pellets) was observed at a burrow near the northern edge of the proposed CPP in 2001 (CNDDB records, July 2002; SMUD 2003j, Figure 9). Reconnaissance level surveys for burrowing owls and other wildlife were conducted February 10-11, 2003, and although no burrowing owls were observed, numerous small mammal burrows were noted and follow up protocol level surveys were recommended (SMUD 2003i, burrowing owl survey results memo). A northwestern pond turtle was observed in Clay Creek north of the project site (SMUD 2001a, Table 8.2-3; SMUD 2003j, Figure 9).

Transmission Line

The proposed transmission line corridor would be constructed from the northwest corner of the CPP to the existing Rancho Seco Nuclear Plant switchyard. The transmission line corridor would be 50 feet wide and 0.4 mile long, with three sets of two towers. SMUD proposes a 150-foot wide construction corridor that would be disturbed for approximately 8 weeks (SMUD 2002z, Biological Resources Assessment Table 2). The proposed locations of the towers are within 250 feet of several wetland features that exist between the plant site and Rancho Seco Nuclear Facility and near the location of the burrowing owl sign discussed above (SMUD 2003j, Biological Assessment Table 2 and Figure 2).

Construction Access Road

SMUD proposes to build a new 0.5-mile long construction access road from the existing paved Rancho Seco Park entrance south to Clay East Road. The access road would be located on an existing firebreak in annual grassland habitat, would cross several seasonal streams, and would be within 250 feet of several vernal pools. The proposed road would be 24 feet wide and paved, with an additional 25-foot wide construction disturbance for 3 months (SMUD 2002j, Biological Assessment Table 2, Figure 2 and Appendix B). The area near the proposed access road was originally delineated in 1993 as part of the Preliminary Delineation of Waters of the United States, Including Wetlands, for the Rancho Seco Park Master Plan (SMUD 2002x, Attachment 206E).

Water Supply Pipeline and Storm Water Detention Basin

The proposed 0.4 mile long 20-inch diameter water supply pipeline would extend underground from the northern end of the CPP site to an existing water supply line for the Rancho Seco Nuclear Plant. It would cross annual grassland, Clay Creek, and several other wetland features. The plant cooling and make-up water would be delivered via an existing 66-inch pipeline that extends from the Folsom South Canal to

the Rancho Seco Plant. Construction of the water pipeline would require a 75-foot wide construction corridor.

The source of the water supply is surface flow from the Lower American River, and would be delivered under contract by the U.S. Bureau of Reclamation (USBR). SMUD has both Appropriative Water Rights (which are under the jurisdiction of the State Water Resources Control Board (SWRCB)), and a federal contract with the USBR for water deliveries. For information on the water supply, see the **Water and Soil Resources** section of the Final Staff Assessment (Part 2).

SMUD has modified the CPP to include Zero Liquid Discharge (ZLD) technology, so no wastewater discharge of cooling water to Clay Creek or evaporation ponds is necessary (SMUD 2002ac). A storm water detention basin would be constructed to contain storm water flows and regulate run-off to Clay Creek from the site and the west side of the laydown area.

Natural Gas Pipeline

The gas pipeline is approximately 26.5 miles long with a permanent easement 35 feet wide and an additional 30-foot wide construction corridor. Starting at the Carson Ice-Gen Cogeneration Facility, the gas pipeline route goes through annual grassland in the Bufferlands, and then ruderal grassland paralleling the Union Pacific railroad tracks on the west side. At Elk Grove Boulevard, the proposed gas pipeline has been realigned (SMUD 2003ax) and turns east to Franklin Boulevard and continues south on the shoulder of Franklin Boulevard to the Union Pacific railroad crossing. The alignment follows the railroad tracks through an agricultural area to Core Road and heads east to Bruceville Road. It then continues east through irrigated pasture to Eschinger Road and follows that to an unimproved farm road. It then turns south and crosses the Cosumnes River, Badger Creek, and a riparian area using HDD technology, and through the Cosumnes River Preserve. After crossing under State Route (SR) 99, the pipeline alignment continues east along Arno Road to Valensin Road, crosses Laguna Creek (using HDD technology), continues along Laguna Road to Twin Cities Road, and then to Clay East Road before ending at the plant site (see **Project Description Figure 4**). Most of the area east of SR 99 consists of agricultural areas that include irrigation canals and other wetland features. Crops include corn, alfalfa, vineyards, and irrigated pasture.

Nine elderberry bushes (*Sambucus* spp.), the host plant for the valley elderberry longhorn beetle, were identified within 100 feet of the proposed gas pipeline route. Six of these are located along the railroad right of way between Dwight Road and Elk Grove Boulevard. Valley elderberry longhorn beetles exit holes were not observed. Two other elderberry plants were located south of Elk Grove Boulevard within a mixed riparian area, between 90 and 95 feet away from the construction corridor. Potential exit holes were observed. These shrubs are located on the west side of Franklin Boulevard; the gas pipeline corridor is located on the east side. Elderberry plants were also reported along the Cosumnes River approximately 70 feet from the HDD laydown area. SMUD provided a complete assessment of the elderberry plants including exit hole presence, stem count, and pictures (SMUD 2003i, Technical Memorandum Table 1 and Photographs).

Based on historical records and known populations, giant garter snakes are present along the gas pipeline route in the Badger Creek area, the Cosumnes River Preserve, the Bufferlands, and east of SR 99. Habitat has been defined by the USFWS as any drainage canals or wetlands from the Carson Ice Co-Gen Generation Plant south to the Folsom South Canal. Habitat is defined as the aquatic habitat and associated uplands within a 200-foot buffer. SMUD conducted surveys of potential giant garter snake habitat and identified 0.61 acres of aquatic and 40.89 acres of upland habitat (SMUD 2003i, Giant Garter Snake Habitat Evaluation Survey).

Burrowing owl reconnaissance level surveys were conducted along the gas pipeline on February 10-11, 2003. Burrowing owls are known to occupy sites at the Bufferlands, at the northern end of the gas pipeline. There are also other potential areas along the gas pipeline that could be occupied. No burrowing owl sign was observed at any of the locations although a follow up protocol level survey was recommended to document and map potential habitat (SMUD 2003i, Burrowing Owl Reconnaissance Survey Results).

Both historic and current Swainson's hawk nests have been recorded along the gas pipeline route (CNDDB 2002). Spring surveys by SMUD identified five potential Swainson's hawk nests along the gas pipeline route (SMUD 2002 3D, Attachment BR-204). The CDFG surveyed the area in 2000 and 2001 and found seven nests along the route (CDFG 2002a). Bufferlands staff has also identified a Swainson's hawk nest along Laguna Station Road, within 0.25 miles of the proposed gas pipeline, and another at Bufferlands Road and Simms Road that have been active since 1994 (Jones, pers. com.).

A wetland delineation and rare plant survey were completed for the proposed gas pipeline route. No listed plant species were observed (SMUD 2002z, Data Response 202). The wetland delineation maps identify several types of wetland areas along the proposed route including: agricultural ditches, drainage ditches, roadside ditches, agricultural ponds, pools, marshes, swales, creeks, open water, and canals (SMUD 2002z, Data Response 206; SMUD 2003e, 404 permit application). The wetland delineation that has been verified by the ACOE identified 4.28 acres of non-jurisdictional wetlands and 1.749 acres of jurisdictional wetlands. The wetland delineation also identified several areas along the gas pipeline route that were vernal pool invertebrate habitat. There is also potential California tiger salamander breeding and aestivating habitat along the gas pipeline route.

Several trees which meet the guidelines for heritage trees as defined by the Sacramento County Tree Preservation Ordinance exist along the gas pipeline route, (SMUD 2002s, Data Response 186). All heritage trees would be avoided during construction. Six trees with a diameter at breast height (dbh) between 5 and 10.6 inches are proposed for removal by SMUD prior to construction of the gas pipeline. An additional six trees would be fenced and avoided during construction (SMUD 2003b, p. 3).

There are three proposed natural gas valve stations and an inter-tie station to be constructed along the proposed gas pipeline route. All of them are located along existing roads in agricultural areas used for crops such as hay and alfalfa, which are

used as foraging habitat by raptors and other bird species (SMUD 2002o, Figure 1-3 to 1-7; SMUD 2002p, Section 2.2).

Phase 2

Compressor Stations

Two new natural gas compressor stations are proposed for Phase 2 of the CPP; one would be located near Winters, California, and the other near the Carson Ice-Gen Cogeneration Plant. The compressor station near Winters is bordered by orchards to the north and agricultural fields to the south. The closest potential nesting tree is within 100 yards of the site, with other trees located approximately 200 yards away. The Winters compressor station would be located within the existing fence line and adjacent to the existing SMUD/PG&E 400/401 interstate pipeline station.

The second compressor station would be adjacent to the existing SMUD #190 Crosstie Compressor Valve Station fenced area, which is located within the Bufferlands (June 11, 2002 site visit and SMUD 2002p). There are large trees within 500 feet of the existing station which have a historic white-tailed kite nest, and could be used by Swainson's hawks, or other nesting birds in any year (Jones, pers. com.). Burrowing owls also occupy burrows near the proposed compressor station.

Laydown Area

The 20-acre power plant construction laydown area south of Clay East Road would also be used for Phase 2. No additional areas are proposed.

IMPACTS

DIRECT AND INDIRECT IMPACTS

Construction, operation, and maintenance activities of the proposed CPP project would result in impacts to habitat and could result in mortality and injury to individuals. The impacts are described below.

Permanent and Temporary Loss of Upland Habitat

Construction, operation, and maintenance of the CPP and the linear facilities would have direct and indirect impacts that would result in both temporary and permanent losses of habitat. The habitats impacted are either wetland or uplands, but can be categorized based on the species that use them. Upland habitats can be used as upland refugia by giant garter snakes; as aestivating habitat for California tiger salamanders; and as foraging and nesting habitat for burrowing owls, Swainson's hawks, and the other bird species listed in **Biological Resources Table 1**. The construction of the CPP and the linear facilities would result in 51.85 acres of permanent and 224.5 acres of temporary impacts to upland habitat (SMUD 2003j, Table 2).

Swainson's Hawk

The CDFG *Staff Report regarding Mitigation for Impacts to Swainson's Hawks in the Central Valley of California* (1994) states that based on studies, Swainson's hawks will forage within an approximate 10-mile radius from their nest site. The report states that new projects, which adversely modify nesting/foraging habitat, should be required to provide mitigation for the project's impacts to the species. SMUD reported that the closest known Swainson's hawk nest to the CPP site and laydown area is approximately 4.9 miles away, south of Valensin Road (SMUD 2003j, Biological Assessment Figure 8) and there is an additional nest site approximately 3 miles away (Holt 2003). Construction of the CPP, access road, valve and inter-tie stations, and transmission line towers would result in the permanent loss of upland forage habitat. The loss of habitat at the laydown area would occur for more than one nesting season and is therefore considered a long-term loss of habitat. Both permanent and long-term impacts are significant and are included in **Biological Resources Table 2.** Short-term impacts to upland forage habitat that could be used by Swainson's hawks along the gas and water pipelines are not significant since disturbance and restoration would occur within one season.

Biological Resources Table 2
Acres Impacted Significantly (By Species and Habitat)

Project Component	Upland Forage	Upland GGS*	Aquatic GGS	Vernal Pool Species (Direct)	Vernal Pool Species (Indirect)	Non- Juris-dictional Wetlands**	Juris-dictional Wetlands
Power Plant:							
Power Plant Footprint, Storm Water Detention Basin, Laydown Area	50			0.743	0.311		2.501
Linear Facilities:							
Access Road	1.5			0.045	0.086		
Transmission Line	≤ 0.01				0.104		
Natural Gas Pipeline	--	40.89	0.61	2.251	4.571	4.280	1.749
Valve, Inter-tie, and Compressor Stations	0.34						--
Water Supply Pipeline	--			0.409	1.805		
Totals:	**51.85**	**40.89**	**0.61**	**3.448**	**6.877**	**4.280**	**4.25**

Source: SMUD 2003e, 2003i, 2003j
*GGS= giant garter snake
** All the wetlands at the power plant site were deemed jurisdictional by the ACOE. In the ACOE 404 application, the wetlands were split into either the project site, or the gas pipeline and were not broken out by access road, transmission line or water pipeline.

Burrowing Owl

Loss of burrowing owl foraging habitat can also occur if upland habitat adjacent to an active burrow is permanently impacted. Burrowing owls rely on approximately 6.5 acres of forage habitat per occupied burrow, calculated on an approximately 300-foot foraging radius around the burrow (CBOC 1993). Construction of the CPP would result in the permanent loss of upland habitat at the power plant site. No active burrows were identified near the project site and laydown area during surveys, although burrowing owl pellets were found at the entrance to a potential burrow along Clay Creek. If burrowing

owls are observed occupying burrows near the CPP site and construction laydown area during spring surveys in 2003, then the loss of forage habitat would be significant. Since gas and water pipeline impacts are temporary, significant impacts to burrowing owl foraging habitat along the gas pipeline are unlikely.

Burrowing owls could also be impacted by the loss of burrows if construction activities result in the destruction of occupied burrows. Occupied burrows have not been located within the construction corridor of the gas pipeline, the power plant site, or the laydown area. SMUD has notified staff that protocol level spring surveys are being conducted in 2003. There is a potential for occupied burrows to be impacted significantly by construction activities.

Other Birds

Other birds such as golden eagles, white-tailed kites, northern harriers, loggerhead shrikes, California horned larks, and tricolored blackbirds are known to nest in the area, and could use the power plant site and laydown area for foraging or nesting habitat in any given year. Along the gas pipeline and other linear facilities, impacts to upland areas are expected to last less than one nesting season. In areas where the gas pipeline would cross agricultural fields, there may be temporary losses in habitat for greater sandhill cranes and other foraging birds, but the impacts would be short-term and would be considered less than significant.

California Tiger Salamander

Although a survey for California tiger salamander was completed by the applicant along the gas pipeline, at the project site and laydown area during the spring of 2002 and none were observed, they have been observed in the Rancho Seco Vernal Pool Area and Howard Ranch. A second year survey for California tiger salamander breeding habitat is currently being conducted by SMUD (Crowe, pers. com). California tiger salamander are known to travel up to 1.0 mile from breeding to aestivating habitat (CDFG, 1997). Depending on the results of the second year survey, construction of the CPP may result in significant impacts to California tiger salamander breeding and aestivating habitat. Gas pipeline construction would occur during the dry season; so impacts to California tiger salamander breeding habitat are unlikely.

Giant Garter Snake

Upland habitat used by giant garter snakes was calculated based on information in the *Draft Recovery Plan for the Giant Garter Snake* (USFWS 1999a). Habitat was considered suitable for giant garter snakes if it had 1) adequate water during the snake's active season to maintain dense populations of food organisms; 2) emergent, herbaceous wetland vegetation, such as cattails (*Typha* spp.), for escape cover and foraging habitat; 3) upland habitat with grassy banks and openings in waterside vegetation for basking; and 4) higher elevation upland habitats for cover and refuge during the snake's inactive season in winter. Upland habitat, (not including paved roads, structures, areas devoid of vegetation and unsuitable crops), was calculated as a 200-foot wide area around suitable aquatic habitat. SMUD submitted a complete list and photos of giant garter snake habitat (SMUD 2003i, Giant Garter Snake Habitat Evaluation Survey). The USFWS guidelines include information on the level of impacts and significance criteria. For the proposed CPP project the impacts are considered

Level II; defined as greater than 20 acres of upland affected by a project. Construction of the gas pipeline would result in a significant impact to giant garter snake upland and aquatic habitat. For the total acres of impacted giant garter snake habitat see **Biological Resources Table 2**.

Permanent and Temporary Loss of Wetland Habitat

Wetlands can be categorized as either aquatic giant garter snake habitat or vernal pool invertebrate habitat with an overlapping category of ACOE jurisdictional or nonjurisdictional wetlands. Vernal pool invertebrate habitat is impacted either indirectly or directly by project activities. Direct effects occur when vernal pool invertebrate habitat is within a construction corridor, or would be altered or filled from project activities. Indirect effects to vernal pool invertebrate habitat occur when habitat is within 250 feet of a proposed action, and the hydrology or habitat could change as a result of project activities. Habitat includes any areas that seasonally pond water in which one or more of the listed vernal pool species could exist (USFWS 1996).

Using the USFWS/ACOE Programmatic Biological Opinion for listed vernal pool crustaceans as a guide (USFWS 1996), SMUD has calculated that a total of 10.325 acres of vernal pool invertebrate habitat would be impacted directly or indirectly by project activities. Although midvalley fairy shrimp and California linderiella fairy shrimp are not included in the Programmatic Biological Opinion, they occupy similar niches and would be impacted by loss of habitat. For calculations of vernal pool habitat impacted by the project see **Biological Resources Table 2.** Of the 10.325 acres impacted by the project, 4.398 acres occur in USFWS proposed critical habitat. Due to the nature of vernal pool and seasonal swale soils and hydrology, and the need for the hard pan layer and uplands around the pool to stay intact to protect the integrity of the pool, any disturbance within 250 feet of a pool or complex would result in a significant impact to that pool.

Since the proposed project would dredge and fill wetlands, SMUD has completed a wetland delineation that has been verified by the ACOE, and has been submitted with the Clean Water Act Section 404 Permit Application (SMUD 2003e). Due to the ACOE's no net loss policy (ACOE 1996), the ACOE may ask for additional wetland mitigation for the jurisdictional impacts, as the wetlands are "waters of the U.S." The amount would be identified in the 404 permit. SMUD is also required to receive Clean Water Act 401 Certification from the Regional Water Quality Control Board (RWQCB). SMUD has identified 4.25 acres of wetlands as jurisdictional and 4.280 as non-jurisdictional at the power plant site, laydown area and along the linear facilities. The wetland acres identified are also aquatic habitat for the giant garter snake and vernal pool species. Impacted sensitive species habitat is greater than the jurisdictional and nonjurisdictional wetlands combined. As staff has already identified the wetland areas as sensitive species habitat, the CPP would not have additional significant impacts to wetlands (**Biological Resources Table 2**).

No impacts to Essential Fish Habitat or anadromous fish species critical habitat have been identified by SMUD. The waterways with sensitive fish habitat would be avoided by using HDD technology to bore under them. A frac-out plan has been developed to address the potential for the inadvertent return of drilling mud to the surface during the HDD bores (SMUD 2003j, Appendix C). The irrigation canals along the gas pipeline

would be crossed using open trench methods. Although some fish species may be found in them, they are not considered fisheries habitat. The NMFS has been consulted and they found that the proposed SMUD Cosumnes Power Plant project is not likely to adversely affect critical habitat or Essential Fish Habitat (NMFS 2003). Construction of the proposed CPP would not result in significant adverse impacts to fisheries habitat.

Species Mortality and Injury

Rare Plants

All of the sensitive plant species identified in **Biological Resources Table 1** are either associated with vernal pool habitats or wetlands. None of the plant species were found during SMUD's special-status plant surveys of the project site and gas pipeline construction corridor, although they are known to occur at the Laguna Stone Lake Preserve site and at the Rancho Seco vernal pools. Construction of the gas pipeline along the Franklin Boulevard alignment avoids the Preserve and would likely avoid significant impacts to plant species. Legenere is also known to occur at the Cosumnes River Preserve, but not along the proposed alignment. Sensitive plants are not likely to be impacted at the project site or along the gas pipeline.

Heritage Trees

SMUD identified several heritage trees along the gas pipeline construction corridor. SMUD did not survey the trees in the riparian area of the Cosumnes River since they intend to use HDD bore technology in that location (SMUD 2002s, Data Response 186). The Sacramento County Tree Preservation Ordinance requires a permit for activities that include trenching, grading, or filling within the dripline of a heritage tree. The County does not allow the removal, killing, or destruction of any heritage tree without a tree permit, or unless authorized as a condition of a discretionary project approval by the Board of Supervisors or Planning or Zoning commissions. Staff and the CDFG (CDFG 2002b) have concerns that the HDD bore under the Cosumnes River could impact heritage trees due to the need for a guidance system, equipment laydown, or from emergency response to a frac-out. SMUD has identified several trees along the gas pipeline alignment that would be removed that are not heritage trees. No heritage trees are proposed for removal, although work may occur within the dripline. Construction activities that result in impacts to heritage trees would be significant.

Invertebrates

Vernal pool invertebrates: The USFWS has communicated to SMUD and staff that vernal pool invertebrate species should be assumed present in all of the areas that seasonally pond water (January 24, 2002 Data Response Workshop). There are 10.325 acres of vernal pool invertebrate habitat along the gas pipeline route and at the site that would be disturbed as a result of constructing the proposed CPP. Individuals of listed crustaceans and their cysts may be directly injured or killed by activities leading to the destruction of the pools in which they exist, or indirectly injured by changes in hydrology, building of roads, use of pesticides/herbicides and introduced predators (USFWS 1996). Impacts to vernal pool habitat would result in adverse impacts to individuals or their cysts which require an Incidental Take Permit under Section 7 of the Federal Endangered Species Act for the federally-listed vernal pool invertebrates.

Valley elderberry longhorn beetle: This federally-listed threatened insect is completely dependent on its host plant, the elderberry plant (*Sambucus* spp.). The project site and gas pipeline route were surveyed for elderberry plants, and nine plants were located. If elderberry plants with exit holes are within 100 feet of construction activities they could be adversely affected by construction, thereby resulting in an adverse impact to the valley elderberry longhorn beetle. Impacts to elderberry plants with exit holes would result in adverse impacts to the valley elderberry longhorn beetle which requires an Incidental Take Permit under Section 7 of the Federal Endangered Species Act.

Fisheries

SMUD has redesigned the CPP to use Zero Liquid Discharge technology (SMUD 2002ac). Therefore, no impacts to fisheries resources in Clay Creek or downstream in the Cosumnes River from cooling water discharge would occur. Storm water from the laydown area would flow north under Clay East Road in two locations. The water being diverted from the eastern portion of the laydown area would flow around the east side of the power plant site to Clay Creek. The other seasonal swale would flow through the laydown area, under Clay East Road and through the plant site to the stormwater detention basin. Before the stormwater is discharged to Clay Creek, the water would have to meet Central Valley Regional Water Quality Control Board (CVRWQCB) standards and would result in a clean discharge (see **Water and Soil** section of the FSA (Part2)). No impacts to fisheries in Clay Creek or downstream impacts are expected from the stormwater being discharged from the laydown area or the storm water detention basin.

The project's water supply source is described above briefly in the Water Pipeline and Stormwater Detention Basin section of this analysis and in more detail in the **Water and Soils Resources** section in the Final Staff Assessment (Part 2). The USBR is in the process of renewing its contract with SMUD, which expires in 2012. As part of the USBR contract renewal process, the environmental impacts of the new contract would be assessed as required by the National Environmental Policy Act. The USBR would initiate consultation with the NMFS to address potential impacts to fisheries in the Lower American River (June 12, 2002 Data Response Workshop).

SMUD completed modeling of flows in the Lower American River and addressed whether there would be changes to water levels and temperatures that would result in significant impacts to fisheries from the proposed water use (SMUD 2003j, Section B). Modeling results showed that impacts to the fisheries listed in **Biological Resources Table 1** would be less than significant. NMFS reviewed the modeling results and determined that the proposed water use for, and the construction of, the CPP is not likely to adversely affect the Sacramento River winter-run Chinook salmon, Central Valley spring-run Chinook salmon, or Central Valley steelhead (NMFS 2003).

HDD bore technology uses drilling mud, such as bentonite, as a drilling lubricant. A frac-out occurs if the bentonite were to release from the drilling hole to the surface through fissures or cracks in the earth. Bentonite can smother invertebrates and aquatic plants, as well as impact fisheries if a frac-out occurred in a stream channel. A frac-out could have impacts to fisheries in the Cosumnes River, Laguna Creek, and

Badger Creek. A frac-out could result in a direct impact if bentonite migrated downstream and contaminated surface water where fish were present. However, SMUD has proposed to complete the HDD bores during the dry season when there is no surface water in the Cosumnes River. SMUD has also developed a Response Plan with detailed procedures for notification and clean-up should a frac-out occur (SMUD 2003j, Appendix C). Therefore, impacts would be less than significant.

Amphibians

Western spadefoot toad: This toad is a federally- and state-listed species of special concern. Western spadefoot toads lay eggs in early March and by the end of spring tadpoles metamorphose into adults and move into upland areas to aestivate (Zeiner 1988). Upland habitat containing small mammal burrows and large cracks in the soil could be used for aestivation during the dry season. There are no historical records from the site or project vicinity that show presence of western spadefoot toads. SMUD conducted surveys for amphibian species along the gas pipeline route and at the project site. No individuals were found (SMUD 2002y). Where they occur in their range, western spadefoot toads are usually abundant (Zeiner 1988). Therefore, no impacts to western spadefoot toads are expected from the CPP.

California tiger salamander: This salamander is a candidate species for federal listing and is a state-listed species of special concern. The CPP project is within the historical range of the California tiger salamander and is within the vicinity of current known locations. SMUD reported that California tiger salamander larvae were found in 2002 at a created vernal pool approximately 0.25 mile east of Rancho Seco Reservoir (SMUD 2002z, Biological Resources Assessment, page 17). For tiger salamander larvae to reach successful transformation to adults, it is necessary for potential breeding sites to contain water for a minimum of 10 weeks in the winter and spring months. California tiger salamanders usually use ephemeral water bodies for breeding (CDFG 1997). Upland habitat containing small mammal burrows and large cracks in the soil could be used for aestivation during the dry season.

There is a potential for California tiger salamander to aestivating on the project site and laydown area. The *Revised Survey Protocol for the California Tiger Salamander (Ambystoma californiense)* (CDFG 1997) suggests that for a negative survey result to be accepted, one or more of the following conditions or minimum survey efforts must support it:

1. The habitat assessment demonstrates that the site is not suitable for California tiger salamander, or
2. Standard aquatic surveys in two consecutive years and a drift fence survey during the second-year survey window all have negative results, or
3. There is no aquatic habitat onsite and a drift fence survey is negative.

On behalf of SMUD, Dr. Mark Jennings completed a survey for the California tiger salamander and western spadefoot toad in April 2002, but did not find either species along the survey route. Bullfrog juveniles and adults (*Rana catesbeiana*), a predatory species, were present at some of the locations with permanent water including the open

water in the Cosumnes River Preserve and the mine tailing pond located east of the CPP site (SMUD 2002y). The presence of introduced fishes, bullfrogs, and crayfish in permanent and intermittent aquatic habitats may limit the successful recruitment of the population of California tiger salamander in the Rancho Seco area (SMUD 2002y). The habitat assessment demonstrates that the CPP project site and laydown area could provide suitable California tiger salamander breeding and aestivating habitat. Predators of California tiger salamander are unlikely to get established in seasonal ponds, as their life cycle is adapted to permanent water bodies. A second year of surveys should be completed. Construction of the CPP could potentially impact breeding and aestivating California tiger salamanders.

Reptiles

Giant garter snake: The giant garter snake is a federally- and state-listed threatened species and is classified as California Fully Protected. Giant garter snakes hibernate underground during the winter months; the active period for the giant garter snake is May 1 – October 1. Throughout this period the snake is active and if disturbed, usually retreats to water (Zeiner 1988). During the hibernation period giant garter snakes may be impacted by construction of the gas pipeline in areas where construction is within 200 feet from the banks of giant garter snake aquatic habitat (USFWS 1997). Giant garter snakes would be affected during the active season if they get trapped in the gas pipeline trench, if they occupy areas that would be used for equipment storage, or are occupying areas within the construction corridor. Giant garter snakes are not present at the power plant site. Since the populations that would be impacted are areas that the USFWS recovery plan designates as important to the recovery of the species, any potential impacts to individuals in these populations are significant.

Northwestern pond turtle: The northwestern pond turtle is a federally- and state-listed species of special concern. Pond turtles are associated with permanent water in a wide variety of habitats, and are known from locations along the gas pipeline and Clay Creek. Pond turtles require basking sites. Eggs are deposited in nests constructed along sandy banks or hillsides. Most activity is diurnal, although crepuscular and nocturnal activity has been observed (Zeiner 1988). Northwestern pond turtles would be affected if they get trapped in the gas or water pipeline trenches. Construction activities at the power plant site or along the gas pipeline could injure or harm individual turtles, and result in potentially significant impacts.

Birds

Western burrowing owl: The burrowing owl is a state-listed species of special concern. Complete protocol burrowing owl survey results have not been provided to staff, although several reconnaissance surveys have been completed. Field surveyors for the CPP checked for burrowing owls while conducting the wetland delineation along the gas pipeline (SMUD 2002m, Data Response 31), but Energy Commission biology staff also requested that SMUD conduct a CDFG protocol (1995) level survey (CEC 2001c, Data Request 31). SMUD's Biological Resources Assessment states that protocol level surveys were completed for the project site and laydown area (SMUD 2002z, p. 18), but protocol level surveys along the gas pipeline have not been conducted. An additional reconnaissance level survey was completed in February 2003 (SMUD 2003b)

The recommended survey protocol (CDFG 1995) has three phases: 1) habitat assessment; 2) burrowing owl and burrow surveys, census, and mapping; and 3) resource summary. Surveys should be conducted during the nesting season (April 15 to July 15) as well as the wintering season (December 1 to January 31). Burrowing owl burrows are considered occupied if they have been used in the last three years (CBOC 1993, CDFG 1995). SMUD has told staff that a protocol level survey of the project site and linear facilities will be completed in April 2003. Those results would provide information on the potential impacts to burrowing owl individuals and pairs.

Several burrowing owl pairs are located on Bufferlands property at the northern end of the proposed pipeline route and burrowing owl pellets were located outside a burrow near the northern edge of the CPP site. SMUD has identified several areas that could be used by burrowing owls (SMUD 2003b). The Energy Commission received a letter from a resident that identified another potential location for burrowing owls along the gas pipeline corridor (French 2002). Wintering burrowing owls within 160 feet of, and nesting burrowing owls within 250 feet of CPP construction activities are susceptible to construction activities that would cause unsuccessful nesting or burrow abandonment. Impacts to nesting success would be significant, although if individuals are not present along the gas pipeline, project site, or laydown area, then impacts would be unlikely.

Swainson's Hawk: The Swainson's hawk is a state-listed threatened species. Significant impacts to nesting Swainson's hawks would occur if construction activities occur within 0.5 mile of a nest, as this can cause nest abandonment or forced fledging. Impacts would also occur if nest trees were trimmed or removed. Swainson's hawk nest sites are considered active if they have been used in the last 5 years as determined by CDFG nesting records or other confirmed sources (CDFG 1994). There are approximately 13 potential nest sites along the gas pipeline based on surveys reported by SMUD (SMUD 2002z, Data Response 204) and CDFG (CDFG 2002a). The Energy Commission also received a letter from a resident that identified a potential Swainson's hawk nesting tree along Clay Station Road (French 2002). Construction activities within 0.5 mile of a nest tree would likely result in significant impacts to nesting pairs.

Other migratory birds and raptors: The Migratory Bird Treaty Act and Fish Game Code protect other migratory birds and raptors (listed in **Biological Resources Table 1**). Some species have potential nesting and/or foraging habitats in areas that would be impacted by construction activities at the CPP site and along the linear facilities. Activities such as tree and shrub removal that result in take or needless destruction of nests or eggs of any protected bird would be considered a significant impact. Significant impacts can be avoided by clearing nesting substrate outside the nesting season, and avoiding nesting individuals.

Greater sandhill cranes are present in the Sacramento Valley in the winter months, during their migration. In the spring greater sandhill cranes migrate north to their nesting areas where they spend the summer before returning back to the Sacramento Valley in the fall. Greater sandhill cranes use the Cosumnes River Preserve and other fields along the gas pipeline route with forage habitat. Greater sandhill cranes are unlikely at the project site. Construction of the natural gas pipeline would occur within

the Cosumnes River Preserve during the dry season when greater sandhill cranes are not present, so impacts are unlikely.

Mammals

The proposed CPP is located within the range of several bat species that are federal species of special concern (**Biological Resources Table 1**). Construction of the CPP would not result in the removal of buildings, nor would the gas pipeline cross bridges or structures that are suitable bat roosting habitat. The riparian areas at the Cosumnes River, Badger Creek, and Laguna Creek would be avoided by using HDD to bore under those areas. Although SMUD proposes to remove some trees, it is unlikely to result in significant impacts to bats.

Phase 2 Construction Impacts

Additional impacts could occur during construction of Phase 2 of the project from species mortality and injury. The compressor stations would not be constructed until Phase 2 and the laydown area would be used again after a potential period of non-use. Although surveys were completed in 2002, and preconstruction surveys would be conducted prior to construction of Phase 1, species such as Swainson's hawks and burrowing owls could occupy the area after those surveys are completed. If construction of Phase 2 resulted in any of the impacts as identified for Phase 1, significant impacts would likely occur. Therefore, prior to construction of Phase 2 surveys would have to be reinitiated and submitted to the Energy Commission, and mitigation measures implemented to prevent significant impacts to individuals from mortality or injury.

The construction laydown area could be disturbed for an extended time period depending on when or if Phase 2 is constructed. The eastern drainage and the western swale that would be fenced and avoided during Phase 1 could be impacted by erosion, sedimentation, and run-off if the area was not revegetated after use. This could also result in changes in hydrology that could impact vernal pools that fill from the surface run-off. If the construction of Phase 2 proceeded shortly after Phase 1 is complete, and the construction lay down area reused, then no revegetation between Phases would be required to reduce impacts. Restoration and revegetation would be completed after construction of Phase 2 is complete.

Impacts from Construction and Operation Noise and Emissions

Construction and operation of the proposed project would result in an increase of air emissions, noise, and light, all of which may result in impacts to biological resources at the site and adjacent areas. There is also the potential of electrocution hazards and avian collisions with the heat recovery steam generator (HRSG) stacks (165 feet in height) and transmission lines (125 feet in height) (SMUD 2001a, Figure 5.3-4a; SMUD 2002j, Figure 2.2-2R).

Noise

Although the area surrounding the proposed CPP is relatively undeveloped, background noise is generated from agricultural activities and the Rancho Seco Nuclear Facility. Night time background noise measurements taken approximately 800 feet to the west of

the project measured 39 dBA (decibels) on average for nighttime measurements (SMUD 2001a, page 8.5-8).

Project construction would result in a short-term temporary increase in the ambient noise level from the use of construction equipment. The increases in noise would be primarily experienced close to the noise source. Dump trucks, backhoes, jack hammers and rock drills have the highest noise level. Pile drivers can be as noisy as 104 dBA, (SMUD 2001a, Figure 8.5-10, 11). At 50 feet from the loudest construction equipment, noise levels could be as high as 98 dBA. Once construction is complete, noise levels would return to ambient levels.

SMUD has not submitted the noise levels for HDD, which could result in noise impacts to nesting birds. Staff is assuming that the HDD would take several days, and would operate for extended periods of time, up to 24-hours a day. During the nesting season, Swainson's hawks are susceptible to nest failure from construction noise. If the HDD was conducted after the female had laid eggs, but prior to young being 2-3 weeks old, the risk of nest failure increases, and the HDD would likely result in significant impacts. Conducting the HDD with a biological monitor present, a monitoring plan in place, and later in the nesting season would reduce potential impacts less than significant levels.

SMUD has proposed noise control equipment as part of the facility's design. At a distance of about 1,000 feet from the CPP site during operation, the plant noise level would be about 56 dBA (SMUD 2001a, page 8.5-14). For a complete analysis of noise, see Section 8.5 of the AFC (SMUD 2001a) and the **Noise and Vibration** section of the Final Staff Assessment.

Increases in noise could result in indirect impacts to sensitive species from nest abandonment, interrupting foraging behavior, or discouraging animals from using the project site vicinity (Knight 1995) and result in adverse impacts to the species. Of the species listed in **Biological Resources Table 1**, bird species that use the proposed CPP area for foraging or nesting habitat would most likely be impacted from exposure to increased noise during construction and operation. Loss of foraging and nesting habitat for bird species, nest abandonment, or forced fledging resulting from construction noise would result in significant impacts.

Air Emissions

Air emissions from both Phases 1 and 2 HRSG stacks would not have a significant effect on surrounding vegetation and soils. Pollutants emitted from the stacks include carbon monoxide (CO), oxides of nitrogen (NO_x) and sulfur dioxides (SO_2), and inhalable particulates (PM_{10}) (SMUD 2001a, page 8.1-28). The maximum 1-hour CO emissions of 917.7 micrograms per cubic meter ($\mu g/m^3$) predicted from the stack combined with the maximum 1-hour CO background air concentration of 9,200 $\mu g/m^3$ results in a total predicted 1-hour concentration of 10,118 $\mu g/m^3$. This is below ambient air quality standards (23,000 $\mu g/m^3$) and below concentrations known to result in growth retardation in plants (115,000 $\mu g/m^3$) and below the concentration found to result in slight reduction of nitrogen fixation (113,000 $\mu g/m^3$) (SMUD 2001a, page 8.2-40).

The maximum annual average of SO_2 concentrations estimated for this project (0.03 $\mu g/m^3$) is lower than the thresholds for chronic plant injury estimated at 130 $\mu g/m^3$ (SMUD 2001a, page 8.2-40).

The maximum predicted annual average of NO_x emissions for this project (0.24 $\mu g/m^3$) is lower than the 219.0 $\mu g/m^3$ threshold limits that can cause decreases in dry weight and leaf area on plants (SMUD 2001a, page 8.2-40). Maximum annual sulfur and nitrogen concentrations modeled at the Desolation and Mokelumne Wilderness Areas are below the Prevention of Significant Deterioration (PSD) Class I Wilderness Area increments (SMUD 2001a, page 8.1-42).

The maximum annual predicted concentration for PM_{10} from the CPP is 0.20 $\mu g/m^3$. Combined with the maximum ambient background concentration of 21.3 $\mu g/m^3$ measured in the project area, this would result in a total impact of 21.5 $\mu g/m^3$ (SMUD 2001a, page 8.1-40).

There are no sensitive habitats in the area such as serpentine grasslands that would be impacted by a slight increase in nitrogen deposition. Staff believes that air quality impacts to biological resources would be less than significant.

Avian Collision and Electrocution

Bird collisions with electric transmission lines, transmission line ground wires, and exhaust stacks can result in significant bird losses when these structures are located in areas where suitable habitat attracts bird populations. Most bird collisions occur during migration in inclement weather. The mine-tailing pond and Rancho Seco Reservoir contain open water that may be used by low-flying flocking bird species. Construction of the proposed CPP would not increase the chances of collision with power plant-related facilities. The mine-tailing pond and reservoir are close to the site, but are not situated in a location that would increase collisions or electrocutions with the power plant related facilities.

Installation of transmission lines and construction of the transmission line towers according to the guidelines suggested by the Avian Power Line Interaction Committee (APLIC 1994 and 1996) would greatly reduce the likelihood that birds would collide with or be electrocuted by transmission lines. The CPP transmission lines, if not constructed according to current guidelines, have the potential to cause a significant increase in collision and electrocute of birds. SMUD would build the 0.4-mile transmission line to APLIC guidelines, which would reduce the potential impact to a less than significant level (SMUD 2001a, p. 8.2-13).

CUMULATIVE IMPACTS

Cumulative impacts are those that result from the incremental impacts of an action added to other past, present, and reasonably foreseeable future actions, regardless of who is responsible for such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

LOSS OF HABITAT

Much of the vernal pool and annual grassland habitats in the Central Valley has been lost due to agricultural practices and urbanization. The Sacramento and Elk Grove urban areas are both expanding. There is also an increase in vineyards in the area near SMUD's property. As vineyards are planted and houses are built annual grassland and vernal pool habitats are converted to agricultural and urban areas, reducing the overall biological diversity of the region. Because of the ongoing conversion and impacts, it is important to mitigate for the loss of sensitive species habitat and to reduce impacts to less than significant levels. The CPP project would not result in significant cumulative impacts to the region when habitat compensation is provided.

WATER USE

Water is an important resource in California, which is allocated to many beneficial uses including, but not limited to, agriculture, industry, municipal, the environment, and recreation. As water is allocated to agriculture and the growing population, less water remains in rivers to be utilized by fish and wildlife. All of the major rivers in California, except for the Cosumnes River, are dammed, which limits the amount of fish spawning habitat available for reproduction. The Lower American River is designated as a fully appropriated stream system by the SWRCB (WR Order 98-08), which means that all the water in the river is allocated. Folsom Reservoir does not have a large cold water pool to draw from; hence Lower American River water temperatures can become increasingly warm in the summer and fall, which has a negative impact on fisheries in the river. Through water conservation and the use of best available technologies, impacts to cold and warm water fisheries habitat can be lessened.

When the USBR renews contracts for Lower American River flows, they will consult with the NMFS through Section 7 of the Federal Endangered Species Act. Through the consultation process, impacts to fisheries and Essential Fish Habitat will be addressed and mitigation will be assessed to reduce significant impacts. The Central Valley Project Improvement Act of 1992 (CVPIA) also increased the amount of water that was allotted to the environment. Through the Anadramous Fish Restoration Program (AFRP), goals were established to increase salmon populations throughout the Central Valley of California.

EBMUD and the County of Sacramento are working on a joint project that would divert water near Freeport, on the Sacramento River to the Folsom South Canal, and eventually the Mokelumne River (EBMUD meeting 2002). EBMUD is completing a new Environmental Impact Report and will consult with the NMFS to address impacts to fisheries from the diversion.

SMUD could lessen its contribution to the cumulative impacts on the Lower American River by replacing the use of fresh in-land water with reclaimed water. In addition, in the event that the USBR is unable to make the full deliveries, SMUD would have a water source that would allow continued power production. SMUD has agreed to use reclaimed water in Phase 2, to the extent it is available, and if determined economically feasible and reasonably priced relative to the costs of other water sources for power production. SMUD has also agreed to consider the possible future use of reclaimed water in Phase 1 in the event reclaimed water in excess of the amount needed for

Phase 2 is available (CEC 2003b, Exhibit 1). The CPP would use ZLD technology, which does minimize the amount of cooling water required (SMUD 2002ac).

Staff supports SMUD's use of ZLD and the potential use of reclaimed water in Phases 1 and 2. These project elements would reduce cumulative impacts to the Lower American River to less than significant levels.

MITIGATION

Below, staff has summarized SMUD's proposed mitigation measures to reduce impacts. Staff is generally supportive of these measures. Staff has identified additional mitigation measures when additional measures are required to reduce impacts to less than significant levels.

GENERAL PROTECTION MEASURES

SMUD has proposed the following best management practices to lessen impacts to biological resources (SMUD 2003j, pp. 36-37). The measures proposed are avoidance and minimization measures, preventative design measures, and construction methods to avoid harassment and harm. Staff agrees with the measures and has incorporated them into **Biological Resources Conditions of Certification**.

SMUD Proposed Mitigation Measures

- Prepare a Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP) (**BIO-5**);
- Provide a Designated Biologist who will oversee compliance with biological mitigation measures and a Biological Monitor who will oversee construction activities and who will submit daily logs and monthly reports to the Energy Commission. Biological monitors will be present onsite during construction activities in sensitive habitats (**BIO-1**, **BIO-2, BIO-3**);
- Provide a worker environmental awareness training program (**BIO-4**);
- Implement preconstruction surveys and resource relocation if necessary (**BIO-2**);
- Designate exclusion zones with fencing that restricts disturbance (**BIO-12**, **BIO-13**);
- Require that construction activities be limited to existing roads, access points, and construction zones as identified and approved (**BIO-13**);
- Prohibit ground disturbance until cleared by a biological monitor (**BIO-2**);
- Allow only authorized vehicles on the project site that have been inspected to ensure fire safety (**BIO-13**);
- Prohibit camping, firearms, fires, or pets in construction areas at any time (**BIO-13**);
- Monitor construction sites daily to ensure that all trash and litter is picked up, placed in closed containers and disposed of daily (**BIO-13**);

- Prohibit refueling or storage of hazardous materials within 200 feet of flagged sensitive resources or 100 feet from “waters of the U.S.” (**BIO-12**);
- Prohibit intentional killing or collection of either plants or wildlife (**BIO-13**);
- Prepare construction monitoring and compliance reports that analyze the effectiveness of mitigation measures (**BIO-2, BIO-5**);
- When there are open trenches, either cover them at the end of the day or construct egress ramps at either end, and survey them prior to construction activities (**BIO-2**, **BIO-13**);

SMUD proposes the following additional general protection measures when working near a waterway and to reduce impacts to fishery habitat (SMUD 2002j, Biological Assessment Section B):

- The use of HDD for construction of the gas pipeline under the Cosumnes River, Laguna Creek, and Badger Creek during summer months when salmon and steelhead are not expected in the river and creeks and when the giant garter snake is active (**BIO-13**);
- The storm water detention basin will be operated to reduce contaminates consistent with storm water requirements, and with a flow dissipater structure to reduce velocity and potential scouring at the outfall (**BIO-12**);
- A Biological Monitor will be onsite or on call during the HDD and will assist in monitoring for frac-outs (**BIO-13**);
- HDD equipment will be located at least 150 feet from the Cosumnes River and Badger and Laguna Creek riparian corridors (**BIO-13**); and
- Design and operate a ZLD system that will process all wastewater produced by the plant [cooling water] (**BIO-12**).

SMUD also committed at workshops to not use dust soil stabilization compounds except water or gravel within 50 feet of a delineated wetland. Nor would SMUD use herbicides or pesticides identified on the USFWS’s prohibitive list (**BIO-13**).

Staff Proposed Mitigation Measures

- SMUD submitted a draft restoration and revegetation plan for the laydown area and gas pipeline. SMUD will mitigate the impacts to the laydown area and gas pipeline by revegetating the area to prevent erosion. Native vegetation will be used where possible (SMUD 2002u). A revised restoration and revegetation plan will be submitted with the BRMIMP (**BIO-5**).
- The Designated Biologist has the authority to ensure conformance with the biological resources Conditions of Certification (**BIO-3**);
- Avoid and minimize wetland loss (**BIO-12**);

HABITAT COMPENSATION

SMUD has proposed the following habitat compensation measures to lessen impacts to biological resources (SMUD 2003j, pp. 36-50). Staff agrees with the measures and has

incorporated them into **Biological Resources Conditions of Certification**. Staff has identified additional measures required to reduce impacts to less than significant levels. Habitat compensation shall be required to reduce impacts.

Swainson's Hawk

SMUD Proposed Mitigation Measures

SMUD has proposed habitat compensation in a 1:1 ratio of suitable foraging habitat for Swainson's hawks at the same location as on-site vernal pool creation and preservation activities. Funding for management would be consistent with the funding for vernal pool species.

Staff Proposed Mitigation Measures

Staff agrees with SMUD's proposed 1:1 habitat compensation ratio. Staff has identified a minimum of 52 impacted acres (**Biological Resources Table 3**) (**BIO-14**). SMUD may overlap Swainson's hawk mitigation with vernal pool habitat if mitigation area is located on SMUD-owned property east of the Rancho Seco Reservoir. Staff agrees that a conservation easement and management plan that includes Swainson's hawk at Rancho Seco would reduce impacts to less than significant levels. Staff requests that prior to evidentiary hearings, SMUD provides a management plan for Swainson's hawks to the Energy Commission for approval. Approval by the CPM, and CDFG will be required prior to construction.

If SMUD purchases mitigation acres for wetlands outside of the Swainson's hawk range and the mitigation area has not been previously approved by the CDFG as suitable Swainson's hawk foraging habitat, staff proposes the following alternative. CDFG has notified staff that there is an existing South Sacramento County Plan (Plan) for mitigating impacts to Swainson's hawks by purchasing habitat compensation and/or conservation easements. The Nature Conservancy, at the Cosumnes River Preserve is the entity implementing the Plan. Although the CPP site is beyond the limits of the Plan's current boundary, The Nature Conservancy may be willing to accept funds (with CDFG's concurrence), combine them with funds they already have and use them to secure Swainson's hawk mitigation.

Biological Resources Table 3
Habitat Compensation Acreage Required for the Project (By Species and Habitat)

Project Component	Upland Forage	GGS* Habitat	Burrowing owl	Vernal Pool Species	Jurisdictional/ Non-Jurisdictional Wetlands**
Total Impacted:	51.85	41.5	Per occupied burrow		8.53
Compensation Ratio	1:1	1:1	6.5 acres/burrow		--
Compensation Acres Required	**51.85**	**41.5**	**--**	**See Table 5**	**--**

Source: SMUD 2003e, 2003i, 2003j
*GGS= giant garter snake
** Staff is not requiring additional habitat compensation for wetlands

Burrowing Owl

SMUD Proposed Mitigation Measures

Provide habitat compensation for any active nest burrow that could not be avoided during construction through consultation with CDFG (SMUD 2003j, p. 50).

Staff Proposed Mitigation Measures

SMUD has identified several areas that could result in potential impacts to burrowing owl habitat. There was at least one burrowing owl burrow observed that has been recently occupied that will be permanently impacted by construction activities at the power plant project site if occupied again prior to construction activities. CDFG guidelines recommend that for permanent impacts, a minimum of 6.5 acres of habitat be replaced at a CDFG approved mitigation bank. To mitigate for the permanent loss of burrowing owl nesting and foraging habitat, a minimum of 6.5 acres of habitat per pair shall be purchased in Sacramento County.

To mitigate for the occupied burrowing owl burrows removed by construction activities along the linear facilities or at the project site, artificial burrows shall be constructed at a 2:1 ratio. Construction of artificial burrows at an approved location would mitigate the loss of burrowing owl burrows to a less than significant level (**BIO-15**).

California tiger salamander

SMUD Proposed Mitigation Measures

No habitat compensation was proposed by SMUD.

Staff Proposed Mitigation Measures

Staff proposes habitat compensation to mitigate for losses to potential breeding and aestivating habitat for California tiger salamanders. Staff believes that mitigation for California tiger salamander can be provided concurrently with mitigation for vernal pool species. The potential wetland mitigation area located east of the Rancho Seco plant (see the Vernal Pool Plants and Invertebrates section below) is also a known California tiger salamander breeding site. The area is also next to Howard Ranch, which also has known occurrences. If SMUD creates wetlands at this location, potential California tiger salamander breeding habitat would also be created. Alternately, SMUD may elect to purchase vernal pool mitigation credits within Sacramento County with California tiger salamanders present and not on SMUD-owned property. Impacts to California tiger salamander habitat would be reduced to less than significant levels with implementation of mitigation measures for vernal pool habitat compensation (**BIO-22**).

Giant Garter Snake

SMUD Proposed Mitigation Measures

SMUD has identified the following mitigation measures (options) for providing giant garter snake habitat compensation. SMUD has identified 41.5 acres of habitat impacts that would require habitat compensation at a 1:1 ratio (**Biological Resources Table 3**). Four options have been proposed.

1) Prior to the start of the gas pipeline construction provide money to the USFWS Endangered Species Fund for 41.5 acres of impacts.
2) Prior to the start of construction on the gas pipeline purchase 41.5 acres of giant garter snake credits in an USFWS-approved mitigation bank. Payment to the bank would fulfill SMUD's responsibility for giant garter snake compensation.
3) Purchase or dedicate through a conservation easement and management plan 41.5 acres of GGS habitat acceptable to the USFWS within the Sacramento Valley Recovery Area. To ensure timely purchase and/or dedication SMUD would place $1,556,250 in an escrow account or trust account prior to the initiation of construction. SMUD would comply with the following:
   a) SMUD would identify a parcel for review by the USFWS prior to gas pipeline construction;
   b) If the USFWS rejects the parcel, then SMUD would have 2 additional months to work with the USFWS to find a new parcel;
   c) Once the USFWS approves the property, SMUD would purchase the property within 3 months of approval;
   d) Within 6 months of USFWS approval, SMUD or a management entity would submit a management plan and conservation easement for review;
   e) Within 6 months of approval of the plan, SMUD would record the easement and begin habitat restoration. SMUD would fund the ongoing endowment. Any funds not needed to support the restoration and conservation activities would be refunded to SMUD.
   f) If SMUD does not purchase a property by May 1, 2004, SMUD would complete either item 1 or 2 above unless the USFWS provides an extension.
4) Prior to construction of the gas pipeline, 41.5 acres of giant garter snake habitat would be protected and managed in perpetuity with a conservation easement and endowment account.

Staff Proposed Mitigation Measures

Staff agrees that 41.5 acres of giant garter snake habitat must be provided to mitigate impacts to giant garter snake (**BIO-20**). Staff does not believe that Option 1 would adequately mitigate impacts to giant garter snake as it is unknown how the funds would be spent and whether those expenditures would provide adequate habitat compensation. The USFWS has notified staff that there is not an established USFWS approved bank in Sacramento County that SMUD could purchase acre credits from per Option 2. Although SMUD has stated the above timeline for habitat compensation per Option 3, the USFWS has notified staff that the management plan for giant garter snake habitat compensation must be approved by the USFWS prior to issuance of the Biological Opinion.

Staff believes that mitigation Option 3 or 4 are feasible but require SMUD to submit the management plan to the USFWS and the Energy Commission for approval prior to evidentiary hearings. If SMUD submits the management plans for the area to the Energy Commission prior to evidentiary hearings, then staff can work with the USFWS to their obtain approved prior to issuance of the Biological Opinion and site mobilization. Restoration of the parcel could then begin at the plant site or related facilities mobilization. With a habitat compensation option identified and management plan

approved by the USFWS and the Energy Commission prior to site mobilization, impacts would be reduced to less than significant levels.

Vernal Pool Plants and Invertebrates

SMUD Proposed Mitigation Measures

SMUD has identified the USFWS Programmatic Biological Opinion mitigation ratios as guidance for mitigating impacts to vernal pool habitat (SMUD 2003j, pp. 39-42). Those mitigation ratios are provided in **Biological Resources Table 4**.

Biological Resources Table 4
USFWS Programmatic Ratios

	Bank	Non-Bank
Preservation (direct and indirect)	2:1	3:1
Creation (direct impacts)	1:1	2:1

Source: USFWS 1996

Per the "Bank" ratios, SMUD would provide 19.7 acres of preserved vernal pools, and 3.0 acres of created vernal pools. At the "Non-Bank" rate, SMUD would provide 29.5 acres of preserved vernal pools and 5.9 acres of created vernal pools (SMUD 2003j, Table 9).

In addition to the above compensation, SMUD proposes the following:

- Design the project and pipeline corridor to avoid, to the extent possible, all vernal pools, man-made ditches, and railroad ditches that could support vernal pool invertebrates;
- Minimize the construction corridor width to avoid vernal pools;
- Conduct preconstruction surveys;
- Implement a storm water pollution prevention plan to reduce the potential for contaminants to enter waters or depressions where vernal pool invertebrates may occur;
- Report the presence of vernal pool invertebrates; and
- Restore the surface topography to preconstruction shape.

Based on the USFWS programmatic biological opinion (USFWS 1996), SMUD has identified several options for mitigation that includes preservation and creation of vernal pool habitat. SMUD could provide preservation and creation of vernal pools on their own property east of the Rancho Seco Reservoir or at a mitigation bank in Sacramento County. The options that SMUD included in the Biological Assessment are as follows:

1) Prior to construction SMUD would purchase off-site mitigation credits in a USFWS-approved mitigation bank. SMUD would purchase 19.7 preservation credits and 3.0 creation credits.

2) Protect and manage in perpetuity with a conservation easement and perpetual endowment 1) vernal pool habitat at SMUD's conservation area on SMUD-owned property east of the Rancho Seco plant, 2) preservation on SMUD-owned property, and 3) enhancement of the degraded vernal pools north of the proposed project site.

There are not enough acres for preservation on SMUD-owned property, so SMUD would still purchase credits at an off-site location. SMUD would perform restoration, initial monitoring, and development of the agency-approved management plan for the SMUD-owned property for a 5-year period. After 5 years, the Sacramento Valley Conservancy (Conservancy) would hold the conservation easement over the lands.

Staff Proposed Mitigation Measures

The USFWS has confirmed that the programmatic ratios (1996) would be applied to the CPP project to mitigate impacts to vernal pool invertebrates to less than significant levels. Staff has developed **Biological Resources Table 5** to clarify the ratios that SMUD has proposed and how they would be applied. Depending on whether SMUD chooses to use a USFWS pre-approved "Bank" or provide habitat compensation at a "Non-Bank," the habitat compensation rates are different (Options 1 and 2 above). The ratios are the same as those presented by SMUD above and Biological Resources Condition 22 (**BIO-22**).

Staff calculated the vernal pool impacts based on information submitted by SMUD, but the final calculated amount differed slightly due to rounding. The acres in the Biological Assessment (SMUD 2003j, Appendix B) were identified to the thousandths of an acre. Based on information from the Biological Assessment, staff determined the following compensation amounts presented in **Biological Resources Table 5**.

Biological Resources Table 5
Habitat Compensation for Vernal Pool Habitat

Direct or Indirect	Affected Area* (acres)	Compensation Ratio "Bank"	Compensation Ratio "Non-Bank"	Total "Bank" (Acres)	Total "Non-Bank" (Acres)
Direct	3.448	2:1 Preservation	3:1 Preservation	6.896	10.344
		1:1 Creation	2:1 Creation	3.448	6.896
Indirect	6.877	2:1 Preservation	3:1 Preservation	13.754	20.631
Total	**10.32**			**20.65 Preservation 3.44 Creation**	**30.98 Preservation 6.90 Creation**

*Affected area is taken from Biological Resources Table 2

If SMUD chooses Option 1 and elects to provide mitigation at an off-site mitigation bank, then mitigation would be in place prior to construction. SMUD would use a mitigation bank for preservation and creation that has already approved management plans by the USFWS. SMUD has confirmed with staff that there is a mitigation bank in Sacramento County that has acres available for sale. Staff shall require that mitigation credits be purchased by site mobilization.

If SMUD chooses Option 2, staff has concerns that mitigation timelines would not be met by SMUD. To date, a management plan for preservation and creation has not been

submitted for approval to the Energy Commission or the USFWS. In the management plan SMUD would have to identify the acres to be used, delineate the wetted acres, provide success criteria and management goals, and provide an endowment account in perpetuity. The USFWS has informed staff that USFWS would need to approve the management plans prior to issuance of the Biological Opinion. Restoration of the vernal pool mitigation area shall begin by ground mobilization for the proposed CPP.

SMUD also received a letter from the Conservancy stating that they believe that the Board of Trustees would consider holding the easement on vernal pool preservation areas at Rancho Seco, given that the Conservancy receive and reach final agreement on final information about acreage, types of wetlands, the extent of necessary monitoring and an endowment account. Prior to the Conservancy holding the conservation easement, the area would have to be approved by the USFWS, an endowment account set up, and the Conservancy would have to agree to the management plan. The Conservancy also stated that SMUD is working on another conservation easement for mitigation that has not been approved and accepted yet by the USFWS. Therefore, the Conservancy has been unwilling to accept that easement (SVC 2003). Staff notes that the Conservancy is willing to hold the easement, but only if their requirements are met. The Conservancy's requirements are consistent with what staff and the USFWS have asked SMUD to submit.

If SMUD submits the management plans for the area to the Energy Commission prior to evidentiary hearings, then staff can work with the USFWS to obtain approval prior to issuance of the Biological Opinion and site mobilization. For Option 2 to be feasible, the mitigation plans will need to be completed and approved by the Energy Commission so restoration of the mitigation area could begin by ground disturbance. Vernal pool restoration takes several years (at least five years) to prove wetland hydrology and function. Therefore, assurance of the creation of vernal pools at Rancho Seco would not be completed for at least five years. Providing both preservation and creation vernal pool compensation consistent with **Biological Resources Table 4** and **Table 5**, and **BIO-22** would reduce impacts to less than significant levels.

SPECIES MORTALITY AND INJURY

Heritage Trees

SMUD Proposed Mitigation Measures

1. Construction plans shall be prepared showing the location of native oaks and heritage trees;
2. Any trees that are removed shall be replaced on an inch-for-inch basis, and be in the form of replanting on site or payment at current market value. One 15-gallon tree equals 1 inch of tree removed; one 24-inch box tree equals 2 inches; and one 36-inch box tree equals 3 inches of tree removed; and
3. Consent of the owner of the land on record prior to tree removal.

Staff Proposed Mitigation Measures

With SMUD's mitigation measures, potential impacts to heritage trees would be reduced to less than significant levels. Mitigation measures and their implementation methods shall be included in the BRMIMP (**BIO-16**). Staff does not recommend additional mitigation measures.

Valley Elderberry Longhorn Beetle

SMUD Proposed Mitigation Measures

For elderberry plants that are within the 100-foot buffer zone established in USFWS guidelines and have stalks greater than 1.0 inch in diameter (USFWS 1999b), SMUD would implement the following measures:

- Fence and flag all areas to be avoided during construction. In areas where encroachment has been approved by the USFWS, provide a minimum setback of at least 20 feet from the dripline;
- Brief contractors on avoidance requirements;
- Erect signs every 50 feet along the edge of avoidance areas, notifying workers of the endangered species habitat;
- Restore any damage done within the buffer area and provide erosion controls and revegetate with appropriate native plants;
- Buffer area must continue to be protected after construction with measures such as weeding, fencing, and trash removal as appropriate;
- No insecticides, herbicides, fertilizers, or other chemicals would be used within the 100-foot buffer of any elderberry plant with stems measuring 1-inch at ground level;
- The applicant must provide a written description of how the buffer areas are to be restored, protected, and maintained after construction is completed; and
- No mowing should occur with five (5) feet of elderberry plant stems and should not damage plants. Mowing may occur July through April to reduce fire hazard.

Staff Proposed Mitigation Measures

Staff supports the mitigation measures proposed by SMUD and recommends the following additional measures to mitigate impacts to the valley elderberry longhorn beetle to less than significant levels. SMUD has proposed avoidance measures along the gas pipeline route, but staff is concerned that elderberry plants could be impacted if there was a frac-out along the Cosumnes River and frac-out clean up and restoration crews impacted the riparian corridor when they accessed the impacted site.

- Identify a conservation area in the BRMIMP that meets the *USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle* (USFWS 1999b);
- Implement the additional USFWS standard conservation guidelines for the VELB, including those outlined below:

- Avoidance may be assumed only when a 100-foot (or wider) buffer is established and maintained around elderberry plants containing stems measuring 1.0 inch or greater in diameter at ground level;
- In buffer areas, construction-related disturbance should be minimized, and any damaged area should be restored following construction;
- Fence and flag all areas to be avoided during construction activities. Encroachment on the 100-foot buffer is only allowed by the USFWS;
    - Elderberry plants that cannot be avoided shall be transplanted following the USFWS procedures. All elderberry plants with one or more stems measuring 1.0 inch or more at the base would be transplanted to a conservation area. The USFWS can grant exemptions to the transplantation requirements; and
    - Each elderberry stem measuring 1.0 inch or greater in diameter at ground level that is adversely affected (i.e., transplanted or destroyed) must be replaced, in the conservation area, with elderberry seedling or cuttings at the required ratios in the Conservation Guidelines (USFWS 1999b).

Implementation of the above measures and following the USFWS guidelines would reduce impacts to the valley elderberry longhorn beetle to less than significant levels (**BIO-17**).

California Tiger Salamander and Northwestern Pond Turtle

SMUD Proposed Mitigation Measures

- Conduct preconstruction surveys to find individuals and relocate them prior to ground disturbance activities;
- Set up construction zone limits at the creek banks, using silt fencing to restrict turtle and salamander access onto construction areas;
- Mark exclusion areas with signs that identify protected habitat;
- Provide a qualified Biological Monitor during construction within potential northwestern pond turtle and California tiger salamander habitat;
- Monitor storm water discharge from the site for water quality parameters identified in the NPDES permit to protect beneficial uses; and
- Find and relocate individuals prior to ground disturbance activities, and relocate to safe areas outside the construction zone limits.

Implementing these mitigation measures would reduce potential impacts to California tiger salamander and northwestern pond turtle to less than significant levels.

Staff Proposed Mitigation Measures

Staff supports the SMUD proposed mitigation measures to minimize impacts to the California tiger salamander and the northwestern pond turtle (**BIO-2, BIO-13**). Energy Commission staff does not recommend additional mitigation measures.

Giant Garter Snake

SMUD Proposed Mitigation Measures

In addition to habitat compensation, the following measures would be implemented along the gas pipeline alignment from the northern end to Folsom South Canal.

- Implement the measures as described in the USFWS programmatic consultation (USFWS 1997) within giant garter snake habitat including:
    a. Vehicles will be confined to existing roads, approved access roads and the right of way. Vehicles will not travel in excess of 20 miles per hour;
    b. Refueling and hazardous material storage will be greater then 100 feet away from water, or located in a designated area that is protected with berms. Spills will be cleaned up immediately to prevent contamination;
    c. Construction areas and right of ways will be flagged to delineate boundaries of construction activities;
    d. Provide a worker environmental awareness program;
    e. A USFWS approved biologist will survey open trenches every morning prior to construction activities;
    f. Twenty-four hours prior to construction activities, the area will be surveyed for snakes by a USFWS approved biologist. If construction activity lapses for two weeks or greater, preconstruction surveys will be repeated;
    g. A USFWS approved biologist will be onsite during construction in giant garter snake habitat to monitor compliance with the biological opinion and relocate snakes if required, report sightings of snakes within 24 hours to the USFWS and to stop activities if a snake is encountered until it is determined that it will not be impacted;
    h. Providing a monitoring report to the USFWS for each giant garter snake survey conducted;
    i. Restrict construction activities in snake habitat to the work window between May 1, and October 1;
    j. Ramp open trenches at the end of each workday at an approximately 2:1 slope. Trench backfilling will occur with 72 hours of pipeline installation to minimize the potential for snakes to fall into the trench. Immediately following trench backfilling, clean-up activities will be initiated;
    k. Vegetation will be cut at ground level, where ever possible, leaving root systems intact. Vegetative debris will be removed from wetlands and waterways for disposal, unless otherwise requested by a landowner or land manager;
    l. No plastic, monofilament, jute or similar erosion control matting that could entangle snakes will be used within 200 feet of snake aquatic habitat;
    m. During construction surface debris will be carefully removed to avoid contact with snakes. Construction materials and debris will be managed to avoid providing habitat;

n. All construction debris and stockpiled materials will be removed at the conclusion of construction;

o. A post-construction monitoring report will be prepared and submitted to the USFWS within 60 calendar days of completion of construction, or within any break of construction that lasts greater than 60 days;

p. Non agricultural lands in the project area will be replanted. Plants will consist of wetland emergents. The goal will be to restore conditions similar to that of adjacent habitats;

q. Emergent wetland plants used for habitat restoration, will at a minimum consist of California bulrush (*Scirpus californicus*) and cattail (*Typha latifolia*);

r. Cover species and the upland seed mix will be used as approved by the USFWS and will consist of 20-40 natives; and

s. Monitor for one year post-construction, and report with photo documentation on the progress of restoration. Monitoring will be provided consistent with USFWS guidelines.

Staff Proposed Mitigation Measures

Staff proposes the following additional guidelines consistent with the USFWS standard avoidance and minimization measures during construction activities in giant garter snake habitat (USFWS 1997, Appendix C).

- The biological monitor will check for giant garter snakes prior to construction activities in areas where they are within 200 feet of any potential aquatic habitat.
- Implementation of the "reasonable and prudent measures" described by the USFWS (1997) are necessary and appropriate to minimize the potential for incidental take of giant garter snakes during the construction of the gas pipeline.
- All construction activity within 200 feet of giant garter snake aquatic habitat will be conducted between May 1 and October 1, the active season for giant garter snakes;
- Any dewatered habitat will remain dry for at least 15 consecutive days after April 15 and prior to excavating or filling the dewatered habitat;
- Construction personnel will participate in a worker environmental awareness program (WEAP) that has been approved by the USFWS, covering topics such as (1) life history (2) habitat that it uses (3) terms and conditions of the Biological Opinion (4) speed limits and potential for road-kill;
- Clearing of vegetation within 200 feet of aquatic habitat will be confined to the minimal area necessary to excavate toe of bank for fill replacement;
- Areas designated for avoidance will be clearly marked as environmentally sensitive and avoided by all construction personnel;
- A qualified biologist will inspect the work area within 24 hours prior to commencement of construction activities. The monitoring biologist will be available thereafter, and if a snake is encountered during construction, the monitoring biologist will have the authority to stop construction until the appropriate corrective action can be taken or it is determined that the snake will not be harmed;

- After construction, any temporary fill or debris shall be removed and disturbed areas will be restored to pre-project conditions according to USFWS guidelines for restoration and or replacement habitat;
- Posted signs will alert workers to the potential presence of snakes;
- Areas disturbed during construction will be revegetated using an erosion control seed mix. Silt fences and erosion control measures will be installed on all disturbed slopes greater than 2:1; and
- Restoration of habitat will be monitored for one year following implementation. A monitoring report will be submitted to the USFWS at the end of the first year. Additional plantings will be implemented if sufficient cover is not attained after the first year, and another monitoring report would be turned in at the end of that year and monitoring of the banks would occur until banks are adequately revegetated.

Implementation of SMUD's and staff's proposed measures would lessen impacts to individuals to less than significant levels (**BIO-19**).

Swainson's Hawk

SMUD Proposed Mitigation Measures

- Provide for foraging habitat compensation at a 1:1 ratio;
- Implement nest surveys within 0.5 miles of project features in early spring 2003 to determine use by Swainson's hawks if construction during that nesting season is anticipated; and
- If project features are within 0.5 miles of Swainson's hawk nesting, avoid construction if feasible. If construction does occur with 0.25 mile of an active nest consult with the CDFG and have a full time Biological Monitor if required. Typical CDFG measures include full-time monitoring while birds are on the nest. Require construction to cease if nesting hawks experience stress, salvage young and pay for rearing costs, and prepare monitoring report results of monitoring and construction.

Staff Proposed Mitigation Measures

In order for SMUD to abide by the California Endangered Species Act, SMUD needs to receive and abide by an Incidental Take Permit from the California Department of Fish and Game (Section 2080.1). The Permit would contain measures to mitigate for the take of individuals (**BIO-7**). The terms and conditions will be included in the BRMIMP (**BIO-5**).

Staff also recommends that SMUD should implement a Swainson's hawk monitoring plan when active nests are within 0.25 miles of construction activities. The plan shall include measures to avoid impacts to nesting Swainson's hawks from the HDD noise. Having a plan in place ensures that mitigation measures have been developed prior to the potential impact, and that the measures can be incorporated without affecting construction (**BIO-13**).

Western Burrowing Owl

SMUD Proposed Mitigation Measures

- Preconstruction surveys will be completed in the spring, to see whether small mammal burrows are occupied by burrowing owls, if construction is planned for that nesting season;
- Protect active nest burrows with a 250-foot buffer during the breeding season (February 1 through August 31) or until young leave the nest; and
- Conduct passive relocation prior to construction if winter burrows are found before February 1, and/or restrict construction activities within 150 feet during the non-breeding season.

Staff Proposed

Staff does not recommend additional mitigation measures. Implementing the measure identified by SMUD would reduce impacts to less than significant levels (**BIO-15**).

Migratory Birds

SMUD Proposed Mitigation Measures

- Surveys will be conducted within 100 feet on either side of the gas pipeline route;
- Surveys will be conducted in December/January before CPP site construction begins;
- Vegetation will be mowed at the project site and construction lay down area by February 1st to minimize the potential for nests within the construction area;
- Nests that do not have eggs or young will be removed;
- Occupied nests will be relocated if approved by the CDFG, or young will be rehabilitated at an approved rehabilitation center;
- Preconstruction surveys will be conducted for nesting raptors within 500 feet of construction activities and mitigation measures would be put in place including a 500-foot exclusion zone; and
- If an exclusion zone cannot be implemented at 500 feet for raptors, then SMUD may: 1) postpone construction in the area until young have fledged, 2) Provide a Biological Monitor and stop construction if it appears that the birds will abandon the nest or young, 3) Consult with the CDFG if construction appears to jeopardize the nesting success and provide for the artificial rearing of eggs or young by qualified staff.

Staff Proposed Mitigation Measures

Staff does not recommend additional mitigation measures (**BIO-2, BIO-13, BIO-18**).

Mitigation for Bird Collisions and Electrocution

SMUD Proposed Mitigation Measures

SMUD proposes to build the new transmission lines to meet the Avian Power Line Interaction Committee 1996 guidelines (APLIC 1996). Construction of the new transmission line to meet the guidelines would reduce impacts to less than significant levels.

Staff Proposed Mitigation Measures

Staff does not recommend additional mitigation measures (**BIO-12**).

FACILITY CLOSURE

Sometime in the future, the CPP would experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an "on-site contingency plan" would be developed by the project owner, and approved by the Energy Commission CPM. Facility Closure mitigation measures would also be included in the BRMIMP (**BIO-6**).

COMPLIANCE WITH LORS

SMUD submitted a proposed schedule, (SMUD 2002a, Data Response 7), to obtain the necessary state and federal permits. This schedule has since been revised several times.

SMUD has submitted applications for all required federal permits. To date, the ACOE has verified the wetland delineation completed by SMUD (SMUD 2003e). A Clean Water Act Section 404 Individual Permit Application has been submitted and the ACOE has initiated consultation with the USFWS and NMFS (ACOE 2003a, 2003b). On April 3, 2003 Revision 8 of the Biological Assessment was accepted as complete by the USFWS (USFWS 2003). Pursuant to USFWS guidelines, the USWFS should issue a Biological Opinion within 135 days. The NMFS has submitted a letter to the ACOE confirming no adverse impacts from the project, based on information provided in the Biological Assessment. The NMFS is not expected to issue a Biological Opinion for the project (NMFS 2003). Once SMUD has the ACOE 404 permit and the USFWS Biological Opinion the project would be in compliance with federal LORS. SMUD is required to have these permits prior to ground disturbance (**BIO-5, -10,** and **-11**).

SMUD has submitted applications for all required State permits, i.e., Water Quality Certification under Section 401 of the state Clean Water Act (SMUD 2003e); Fish and Game Code, Section 2081 – Incidental Take Permit; and Fish and Game Code, Section 1600 - Streambed Alteration Agreement (SMUD 2002ak). The application for the 2081 has not been deemed complete, and SMUD has provided additional information to the CDFG. The Streambed Alteration Agreement Permit Application is also being updated to include the project site impacts. The CDFG requires environmental review documentation (i.e., the Energy Commission licensing process) prior to issuance of

permits. Therefore, until completion of the Energy Commission's licensing process, CDFG cannot issue an Incidental Take Permit or Streambed Alteration Agreement. Once all State permits are obtained, then the project would be considered to be in compliance with California LORS (**BIO-7**, **-8**, and **-9**).

Staff has spoken with the County of Sacramento Tree Coordinator and SMUD has submitted the locations of potential heritage trees to the County for review. Mitigation is required to comply with the County Tree Ordinance (**BIO-16**). SMUD is in compliance with all of the other county LORS as identified in the LORS section and the County has found the proposed SMUD project to be in consistent with the General Plan Map and Policies (SCBOS, 2002a). Sacramento County Planning staff also found that with mitigation, the CPP would be in compliance with the county conservation policies.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

Staff received two comment letters regarding the **Biological Resources** section of the PSA.

KF-10: A resident adjacent to the pipeline has burrowing owls on her property within 100 feet of gas pipeline construction, and a pair of nesting Swainson's hawks along Clay Station Road. The birds forage on her pastureland and could forage on the proposed site. The application and staff's PSA were inadequate in addressing impacts and no FSA should be filed until staff has adequate information to analyze.

Response: Since the PSA was filed, SMUD has worked with staff, the USFWS, and CDFG to resolve outstanding issues. SMUD has completed an additional reconnaissance level survey for burrowing owls and are conducting protocol level surveys April 2003. Staff has proposed mitigation measures for burrowing owls based on the California Burrowing Owl Consortium and the CDFG recommendations (see above **Western Burrowing Owl, Staff Proposed Mitigation** section). Staff has also proposed Conditions of Certification **BIO-15** and **BIO-18** to reduce impacts to burrowing owls to less than significant levels. Nesting burrowing owls would have to be avoided, and impacts to foraging and nesting habitat would be mitigated.

Swainson's hawk nesting sites have been identified along the entire gas pipeline route. Mitigation measures have been included in the Conditions of Certification to provide replacement forage habitat (**BIO-14**). Proposed mitigation measures would require SMUD to avoid nesting pairs. Construction within a 0.5 mile of an active nest would require a biological monitor to be present and a monitoring plan to be in place. Because construction activities could potentially impact Swainson's hawks, SMUD would be required to obtain a CDFG 2081 permit prior to construction (**BIO-7**). Preconstruction surveys would also be required to identify current locations of nesting Swainson's hawks so the appropriate mitigation measures can be applied (**BIO-18**).

ELK-7: The City of Elk Grove is concerned that significant biological impacts would result from construction activities along the gas pipeline, including impacts to the Stone Lakes Open Space Preserve, Swainson's hawks, vernal pool fairy and tadpole shrimp,

giant garter snake, burrowing owls, valley elderberry long beetle, northwestern pond turtle and California tiger salamander.

Response: The gas pipeline has been rerouted around the Stone Lakes Laguna Preserve, which is a vernal pool mitigation area, to Franklin Boulevard. Vernal pools within the preserve will be avoided. The gas pipeline would not cross the Stone Lakes Wildlife Refuge. Staff and SMUD have proposed mitigation measures (see above **Mitigation** section) and conditions of certification to address impacts to all special status-species potentially impacted by the project. Since publication of the PSA, SMUD has also proposed additional mitigation measures. Swainson's hawk compensation measures are outlined in **BIO-14** and **BIO-7**. Vernal pool invertebrate habitat compensation is outlined in **BIO-22**. Giant garter snake habitat compensation, avoidance, minimization, and restoration measures are included in **BIO-19** and **BIO-20**. Burrowing owl mitigation is outlined in **BIO-14** and **BIO-18**. Valley elderberry longhorn beetle mitigation is outlined in **BIO-17**. Northwestern pond turtle and California tiger salamander mitigation is included in the Designated Biologist Duties **BIO-2**. California tiger salamander habitat losses are outlined with vernal pool mitigation in **BIO-22**.

ELK-8: The City recommends further analysis of alternative gas pipeline routes to assist in reducing significant impacts to biological resources.

Response: Staff addressed alternate gas pipeline routes in the **Biological Resources** section of the PSA. Since then, SMUD has agreed to reroute the gas pipeline, which would reduce impacts to vernal pools, elderberry plants, and an area set-aside for mitigation.

ELK-9: The City would like justification of staff's conclusion that there are only 205 acres of temporary impacts, and no permanent impacts from the gas pipeline.

Response: As stated in this FSA, staff concludes that there are some permanent impacts from the gas pipeline on wetlands and upland habitat. SMUD has proposed a 35-foot wide permanent easement and an additional 30-foot wide construction corridor. After construction, the gas pipeline would be underground. Construction would occur over two dry seasons with restoration of the area trenched occurring within the season. There are some above ground facilities included in **Biological Resources Table 2** that staff considered as permanent impacts to foraging habitat. In addition to the loss of upland habitat from the above ground facilities, wetlands and giant garter snake habitat would also be directly impacted from gas pipeline construction and staff has proposed habitat compensation as mitigation. The only category that staff found no permanent impacts to was upland forage, since staff considers upland forage impacts to be short-term and temporary (less than one nesting season). **Biological Resources Tables 2 and 4** includes updated impacts and habitat compensation acreage.

ELK-10: The City would like more information regarding potential impacts to trees from construction activities within the Laguna Stone Lake Preserve.

Response: SMUD has amended the project to avoid the Preserve, so no trees within the preserve would be impacted.

CONCLUSIONS AND RECOMMENDATION

SMUD has submitted many of the items that were listed as outstanding in staff's PSA. However, there are still outstanding documents that SMUD must submit prior to evidentiary hearings. The following is a list of outstanding information.

- A management plan for the 20.6 acres of preserved vernal pools at an USFWS-approved mitigation bank or for the 30.9 acres of preserved vernal pools located on SMUD-owned property and off-site mitigation area. The management plan should include, but is not limited to, the identification of the specific acres proposed for mitigation; the restoration entity; the management entity (a signed confirmation letter from the management entity); proposed language for a conservation easement; and a Property Analysis Record (PAR) analysis (to determine the sum of money required to be placed in a mitigation endowment fund for preserved vernal pools on SMUD-owned property, if necessary). The conservation easement for the preserved vernal pool area on SMUD-owned property must be in place and/or the mitigation credits must be purchased prior to site mobilization.

- A management plan for the 3.4 acres of created vernal pools at an USFWS-approved mitigation bank or for the 6.9 acres of created vernal pools located on SMUD-owned property (within the 70-acre SMUD-owned property proposed for vernal pool creation). The management plan should include, but is not limited to, the identification of the specific acres proposed for mitigation; the restoration entity; the management entity (a signed confirmation letter from the management entity); proposed language for a conservation easement; and a Property Analysis Record (PAR) analysis (to determine the sum of money required to be placed in a mitigation endowment fund for created vernal pools on SMUD-owned property, if necessary). The conservation easement for the created vernal pool area on SMUD-owned property must be in place and/or the mitigation credits must be purchased prior to site mobilization.

- A management plan for 41.5 acres of giant garter snake (GGS) habitat at an USFWS-approved mitigation bank or other USFWS-approved area. The management plan should include, but not limited to: identification of the specific acres proposed for mitigation; the restoration entity (if required); the management entity (a signed confirmation letter from the management entity); proposed language for a conservation easement; and a Property Analysis Record (PAR) analysis (to determine the sum of money required to be placed in a mitigation endowment fund for GGS if habitat is not at a mitigation bank). The conservation easement for the GGS area must be in place and/or the mitigation credits must be purchased prior to site mobilization.

- Proposed language for a conservation easement of 51.9 acres at a California Department of Fish and Game-approved mitigation bank or on SMUD-owned property for Swainson's Hawk.

- A revised BRMIMP that incorporates all of the updated mitigation measures that SMUD proposed in the Biological Resources Assessment, the Wetland Delineation Report, and staff's comments.

If the above plans are submitted to the Energy Commission for approval prior to Evidentiary Hearings, then staff would have time to work with SMUD and approve them prior to site and related facilities mobilization. In order for staff to be assured that the habitat compensation provided by SMUD adequately mitigates all impacts and to testify to that at evidentiary hearings, staff must review these management plans, which have not, to date, been submitted by the applicant. Furthermore, these management plans are required by USFWS before a Biological Opinion will be approved. The 404 and 401 permits and Biological Opinion (with approved management plans) are required before site disturbance and construction can begin (see **BIO-9**, **BIO-10**, **BIO-11**).

Staff has not included mitigation measures or conditions of certification to address potential impacts from Phase 2 of the proposed CPP. When SMUD has determined that Phase 2 would be constructed they would need to submit biological resources information based on current surveys and address potential impacts at that time.

At this time staff does not have all the information necessary to recommend certification of the CPP. Staff believes that once the above mitigation plans are submitted, staff would recommend approval of the project.

CONDITIONS OF CERTIFICATION

Designated Biologist Selection

BIO-1 The project owner shall submit the resume, including contact information, of the proposed Designated Biologist and Biological Monitors to the CPM for approval.

The Designated Biologist must meet the following minimum qualifications:

1. Have a Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field;
2. Have three years of experience in field biology or current certification of a nationally recognized biological society, such as The Ecological Society of America or The Wildlife Society;
3. Have at least one year of field experience with biological resources found in or near the project area; and

Verification: The project owner shall submit the specified information at least 60 days prior to the start of any site (or related facilities) mobilization. Site and related facility activities shall not commence until an approved Designated Biologist is available to be on site.

If the Designated Biologist needs to be replaced, the specified information of the proposed replacement must be submitted to the CPM at least 10 working days prior to

the termination or release of the preceding Designated Biologist. In an emergency, the project owner shall immediately notify the CPM to discuss the qualifications and approval of a short-term replacement while a permanent Designated Biologist is proposed to the CPM for consideration.

Designated Biologist Duties

BIO-2 The Designated Biologist shall perform the following during any site (or related facilities) mobilization, ground disturbance including cultural resources testing, grading, construction, operation, and closure activities:

1. Advise the project owner's Construction/Operation Manager, supervising construction and operations engineer on the implementation of the biological resources Conditions of Certification;
2. Be available to supervise or conduct mitigation, monitoring, and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as wetlands and special status species or their habitat;
3. Clearly mark sensitive biological resource areas and inspect these areas at appropriate intervals for compliance with regulatory terms and conditions;
4. Inspect active construction areas where animals may have become trapped prior to construction commencing each day. At the end of the day, inspect for the installation of structures that prevent entrapment or allow escape during periods of construction inactivity. Periodically inspect areas with high vehicle activity (parking lots) for animals in harms way;
5. Notify the project owner and the CPM of any non-compliance with any biological resources Condition of Certification;
6. Respond directly to inquiries of the CPM regarding biological resource issues; and
7. Implement preconstruction surveys.

Verification: The Designated Biologist and Biological Monitors shall maintain written records of the tasks described above, and summaries of these records shall be submitted in the Monthly Compliance Reports.

During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

Designated Biologist Authority

BIO-3 The project owner's Construction/Operation Manager shall act on the advice of the Designated Biologist to ensure conformance with the biological resources Conditions of Certification.

If required by the Designated Biologist, the project owner's Construction/Operation Manager shall halt all site mobilization, ground

disturbance, grading, construction, and operation activities in areas specified by the Designated Biologist.

The Designated Biologist shall:

1. Require a halt to all activities in any area when determined that there shall be an adverse impact to biological resources if the activities continued;
2. Inform the project owner and the Construction/Operation Manager when to resume activities; and
3. Notify the CPM if there is a halt of any activities, and advise the CPM of any corrective actions that have been taken, or shall be instituted, as a result of the halt.

Verification: The Designated Biologist must notify the CPM immediately (and no later than the following morning of the incident, or Monday morning in the case of a weekend) of any non-compliance or a halt of any site mobilization, ground disturbance, grading, construction, and operation activities. The project owner shall notify the CPM of the circumstances and actions being taken to resolve the problem.

Whenever corrective action is taken by the project owner, a determination of success or failure shall be made by the CPM within five working days after receipt of notice that corrective action is completed, or the project owner shall be notified by the CPM that coordination with other agencies shall require additional time before a determination can be made.

Worker Environmental Awareness Program

BIO-4 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program (WEAP) in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or any related facilities during site mobilization, ground disturbance, grading, construction, operation and closure are informed about sensitive biological resources associated with the project.

The WEAP must:

1. Be developed by or in consultation with the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
2. Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
3. Present the reasons for protecting these resources;
4. Present the meaning of various temporary and permanent habitat protection measures;
5. Identify whom to contact if there are further comments and questions about the material discussed in the program; and

6. Include a training acknowledgment form to be signed by each worker indicating that they received training and shall abide by the guidelines.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Verification: At least 60 days prior to the start of any site (or related facilities) mobilization, the project owner shall provide to the CPM two (2) copies of the WEAP, all supporting written materials and electronic media prepared or reviewed by the Designated Biologist and a resume of the person(s) administering the program.

The project owner shall provide in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a running total of all persons who have completed the training to date.

The signed training acknowledgement forms shall be kept on file by the project owner for a period of at least six months after the start of commercial operation.

During project operation, signed statements for active project operational personnel shall be kept on file for six months, following the termination of an individual's employment.

Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP)

BIO-5 The project owner shall submit two copies of the proposed BRMIMP to the CPM (for review and approval) and to CDFG and USFWS (for review and comment) and shall implement the measures identified in the approved BRMIMP.

The final BRMIMP shall identify;

1. All biological resources mitigation, monitoring, and compliance measures proposed and agreed to by the project owner;
2. All biological resources Conditions of Certification identified in the Commission's Final Decision;
3. All biological resource mitigation, monitoring and compliance measures required in federal agency terms and conditions, such as those provided in the USFWS Biological Opinion and the ACOE 404 permit;
4. All biological resources mitigation, monitoring and compliance measures required in other state agency terms and conditions, such as those provided in the CDFG Incidental Take Permit and Streambed Alteration Agreement and Regional Water Quality Control Board permits;
5. All biological resources mitigation, monitoring and compliance measures required in local agency permits, such as site grading and landscaping requirements;
6. All sensitive biological resources to be impacted, avoided, or mitigated by project construction, operation and closure;

7. All required mitigation measures for each sensitive biological resource;
8. Required habitat compensation strategy, including provisions for acquisition, enhancement, and management for any temporary and permanent loss of sensitive biological resources;
9. A detailed description of measures that shall be taken to avoid or mitigate temporary disturbances from construction activities;
10. All locations on a map, at an approved scale, of sensitive biological resource areas subject to disturbance and areas requiring temporary protection and avoidance during construction;
11. Aerial photographs, at an approved scale, of all areas to be disturbed during project construction activities - one set prior to any site or related facilities mobilization disturbance and one set subsequent to completion of project construction. Include planned timing of aerial photography and a description of why times were chosen;
12. Duration for each type of monitoring and a description of monitoring methodologies and frequency;
13. Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
14. All performance standards and remedial measures to be implemented if performance standards are not met;
15. A discussion of biological resources related facility closure measures;
16. A process for proposing plan modifications to the CPM and appropriate agencies for review and approval;
17. A copy of all biological resources permits obtained;
18. A copy of the Restoration and Revegetation Plan for the laydown area, gas pipeline, water pipeline and transmission line;
19. A copy of the Landscaping Plan that includes tree species and location;
20. A frac-out contingency plan;
21. Project reporting, field verification and full disclosure forms;
22. A list of herbicides and pesticides that shall not be used during construction or operations; and
23. A nesting raptor monitoring plan.

Verification: The project owner shall provide the proposed BRMIMP at least 60 days prior to start of any site (or related facilities) mobilization.

The CPM, in consultation with the CDFG, the USFWS, and any other appropriate agencies, shall determine the BRMIMP's acceptability within 45 days of receipt.

The project owner shall notify and seek approval from the CPM no less than five working days before implementing any modifications to the approved BRMIMP.

Any changes to the approved BRMIMP must also be approved by the CPM in consultation with CDFG, the USFWS, and appropriate agencies to ensure no conflicts exist.

Implementation of the mitigation measures shall be reported in the monthly and annual compliance reports and submitted to the CPM for review. Within thirty (30) days after completion of project construction, the project owner shall provide to the CPM, for review and approval, a written report identifying which items of the BRMIMP have been completed; a summary of all modifications to mitigation measures made during the project's site mobilization, ground disturbance, grading, and construction phases; and which mitigation and monitoring items are still outstanding.

Closure Plan Measures

BIO-6 The project owner shall incorporate into the permanent or unexpected permanent closure plan, and the BRMIMP, measures that address the local biological resources.

The planned permanent or unexpected permanent closure plan shall address the following biological resources related mitigation measures (typical measures are):

1. Removal of transmission conductors when they are no longer used and useful;
2. Removal of all power plant site facilities and related facilities;
3. Measures to restore wildlife habitat to promote the re-establishment of native plant and wildlife species; and
4. Revegetation of the plant site and other disturbed areas utilizing appropriate seed mixture.

Verification: At least 12 months prior to commencement of closure activities, the project owner shall address all biological resources related issues associated with facility closure, in a Biological Resources Element. The Biological Resources Element shall be incorporated into the Facility Closure Plan and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

Incidental Take Permit

BIO-7 The project owner shall acquire an Incidental Take Permit from the California Department of Fish and Game (CDFG) (per Section 2081(b) of the Fish and Game Code; California Endangered Species Act) and incorporate the terms and conditions into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the final CDFG Incidental Take Permit.

Streambed Alteration Agreement

BIO-8 The project owner shall acquire a Streambed Alteration Agreement from the CDFG (per Section 1600 of the Fish and Game Code), and incorporate the biological resource related terms and conditions into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the final CDFG Streambed Alteration Agreement.

Regional Water Quality Control Board Certification

BIO-9 The project owner shall acquire the Regional Water Quality Control Board Section 401 state Clean Water Act certification, and incorporate the biological resource related terms and conditions into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall provide the CPM with a copy of the final Regional Water Quality Control Board's certification.

Federal Biological Opinion

BIO-10 The project owner shall provide final copies of the Biological Opinion per Section 7 of the Federal Endangered Species Act obtained from the U.S. Fish and Wildlife Service. The terms and conditions contained in the Biological Opinions shall be incorporated into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the U.S. Fish and Wildlife Service's Biological Opinion.

U.S. Army Corps of Engineers Section 404 Permit

BIO-11 The project owner shall provide a final copy of the U.S. Army Corps of Engineers Section 404 of the Federal Clean Water Act permit. The biological resources related terms and conditions contained in the permit shall be incorporated into the project's BRMIMP.

Verification: At least 30 days prior to the start of any site or related facilities mobilization activities, the project owner shall submit to the CPM a copy of the U.S. Army Corps of Engineers 404 permit.

Preventative Design Mitigation Features

BIO-12 The project owner shall modify the project design to incorporate all feasible measures that avoid or minimize impacts to the local biological resources. These include:

1. Design of transmission line poles, access roads, pulling sites, and storage and parking areas to avoid identified sensitive resources;

2. Avoiding and minimizing wetland loss;
3. Prohibiting refueling or storage of hazardous materials within 200 feet of flagged sensitive resources, or 100 feet from “waters of the U.S.”;
4. Design and construction of transmission lines and all electrical components in accordance with APLIC 1996 guidelines to reduce the likelihood of electrocutions and collisions of large birds;
5. Discharges from the storm water detention basin are of sufficient water quality to not effect fish and northwestern pond turtle habitat downstream;
6. Dry season trenching and grading within potential California tiger salamander habitat;
7. The stormwater detention basin shall be operated to reduce contaminates consistent with stormwater requirements, and with a flow dissipater structure to reduce velocity and potential scouring at the outfall;
8. That the setback from the seasonal stream and swale that cross the laydown area is at least 100 feet;
9. Design and operate a ZLD system that shall process all wastewater produced by the plant; and
10. Constructing the gas pipeline using an alternative route that does not cross the Laguna Stone Lake Preserve;

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP.

Construction Mitigation Management to Avoid Harassment or Harm

BIO-13 The project owner shall manage their construction site, and related facilities, in a manner that avoids or minimizes impacts to the local biological resources. Measures shall include the following:

1. Temporarily fence and provide wildlife escape ramps for construction areas that contain steep walled holes or trenches if outside of an approved, permanent exclusionary fence. The temporary fence shall be hardware cloth or similar materials;
2. Require that construction activities be limited to existing roads and identified approved construction areas;
3. Implement work windows when construction activities are close to sensitive resources;
4. Monitor construction sites daily to ensure that all trash and litter is picked up, placed in closed containers and disposed of daily;
5. Feeding of wildlife shall be prohibited;
6. Prohibit non-security related firearms or weapons from being brought to the site;
7. Prohibit pets from being brought to the site;

8. Prohibit intentional killing or collection of either plants or wildlife;
9. Report all inadvertent deaths of sensitive species to the appropriate biologist. Injured animals shall be reported to the CPM, the USFWS and the CDFG. The project owner shall follow instructions that are provided by the USFWS and the CDFG;
10. Construction activities within 0.25 mile of an active raptor nest shall be conducted in compliance with a monitoring plan to be submitted.
11. Laydown and staging areas near giant garter snake aquatic habitat shall be at least 200 feet inland from the banks;
12. Clearing and grading of the project site and laydown area shall be conducted after the vernal pools and seasonal swales in the vicinity are dry. Alternately, clearing or grading shall not begin without erosion and sediment control measures in place and approved to ensure that adjacent wetlands are not contaminated by sediments from the site. Sensitive biological resources adjacent to the site shall be fenced and/or flagged to minimize and avoid impacts;
13. No dust soil stabilization compounds except water or gravel shall be used within 50 feet of a delineated wetland;
14. No use of equipment at the HDD bore site that shall result in cutting back vegetation in the riparian areas;
15. Allow only authorized vehicles on the project site that have been inspected to ensure fire safety;
16. The use of HDD for construction of the gas pipeline under the Cosumnes River, Laguna Creek, and Badger Creek during summer months when salmon and steelhead are not expected in the river and creeks and when the giant garter snake is active;
17. A biological monitor shall be onsite or on call during the HDD and shall assist in monitoring frac-outs;
18. HDD equipment shall be located at least 150 feet from the Cosumnes River and Badger and Laguna Creek riparian corridors; and
19. No use of the herbicides or pesticides on the USFWS's prohibitive list.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP.

Upland Habitat Replacement

BIO-14 To compensate for impacts to upland foraging habitat for Swainson's hawks, the project owner shall purchase or place a conservation easement on a minimum of 51.9 acres of replacement habitat in Sacramento County. The project owner shall provide additional monetary funds for long-term management and monitoring of the protected lands as necessary based on the Center for Natural Lands Management Property Analysis Record, or a similar cost analysis. The project owner shall identify the location of the mitigation area and the entity

that shall manage the property in perpetuity for approval by the CPM prior to ground disturbance.

Verification: Fifteen (15) days prior to site or related facilities mobilization, the project owner shall provide a copy of the check to the CPM and a letter from the CPM approved land management organization stating the amount of funds received, and the amount of acres conserved in long term management.

Burrowing Owl Habitat and Burrow Replacement

BIO-15 To compensate for permanent impacts to upland foraging habitat and/or occupied burrows at the site and related facilities, the project owner shall purchase a minimum of 6.5 acres of foraging habitat for every pair or unpaired resident bird occupying a burrow within 250 feet of permanent facilities at an approved mitigation bank in Sacramento County. The project owner shall provide additional monetary funds for long-term management and monitoring of the protected lands as necessary based on the Center for Natural Lands Management Property Analysis Record, or a similar cost analysis. The project owner shall also provide artificial burrows at an approved location for all occupied burrows that are destroyed from project activities. The project owner shall identify the location of the mitigation area and the entity that shall manage the property in perpetuity for approval by the CPM prior to ground disturbance.

Verification: Fifteen (15) days prior to site or related facilities mobilization the project owner shall provide a copy of the check to the CPM. At the same time the project owner shall also provide a letter from the CPM approved land management organization stating the amount of funds received, and the amount of acres purchased and/or constructed artificial burrows in long term management.

If burrowing owls preconstruction surveys are reported and burrowing owls are not occupying burrows at the CPP site, or along the project related facilities than habitat compensation shall not be required.

Heritage Tree Protection

BIO-16 The project owner shall implement the following:

- Construction plans shall be prepared showing the location of native oaks and heritage trees;
- Any trees that are removed shall be replaced on an inch-for-inch basis, and be in the form of replanting on site or payment at current market value. One 15 gallon tree equals 1 inch of tree removed; One 24-inch box tree equals 2 inches; and one 36-inch box tree equals 3 inches of oak tree removed; and
- Consent of the owner of the land on record prior to tree removal.

Verification: All of the mitigation measures and their implementation methods shall be included in the BRMIMP. The tree replacement locations shall be submitted to the CPM for approval.

Valley Elderberry Longhorn Beetle

BIO-17 The project owner shall conduct the following:

1. Identify a conservation area that meets the USFWS Conservation Guidelines for the Valley Elderberry Longhorn Beetle (USFWS 1999b) and
2. Follow the USFWS (1999) standard conservation guidelines for the valley elderberry longhorn beetle.

Verification: All mitigation measures and their implementation methods shall be included in the BRMIMP.

Surveys

BIO-18 The project owner shall conduct the following surveys:

1. California tiger salamanders and western spadefoot toads surveys will be conducted the season prior to site or related facilities mobilization.
2. Western burrowing owl surveys within a 500-foot buffer to the project site and all related linear facilities according to CDFG protocol (1995) shall be conducted prior to site mobilization. Known occupied burrows shall be identified and mapped. Monitoring of the active nests shall be conducted by the Designated Biologist throughout the initial construction season to identify additional losses from nest abandonment.
3. Pre-construction Swainson's hawk surveys shall be conducted out to 0.5 mile from all project construction areas. All nests shall be mapped within the 0.5 mile construction buffer. Surveys shall be conducted during the Swainson's hawk nesting season. If active nests are found, they shall be monitored according to CDFG guidelines (1994).
4. Pre-construction surveys for nesting birds, including raptors, shall be conducted out to a 500-foot buffer from the project site and all related facilities during the nesting season. Monitoring of the active nests shall be conducted by the Designated Biologist until young birds can independently feed and protect themselves before construction within the 500-foot buffer may begin.
5. A second preconstruction survey for all sensitive biological resources shall be conducted within 48 hours prior to clearing or grading activities.

Verification: Surveys shall be conducted within in the appropriate season, prior to site or related facilities mobilization. Within 10 days of completion, survey results shall be submitted to the CPM and included in the BRMIMP.

Giant Garter Snake

BIO-19 The project owner shall implement the mitigation measures in the USFWS giant garter snake formal consultation guidelines (1997). Mitigation measure shall be implemented in all previously identified habitat along the gas pipeline corridor.

Verification: All of the mitigation measures identified by SMUD and Energy Commission staff in the mitigation section and their implementation methods shall be included in the BRMIMP. The project owner shall include the status of mitigation measure implementation in the monthly and annual compliance reports for submittal to the CPM.

Giant Garter Snake Habitat Compensation

BIO-20 To mitigate for impacts to giant garter snake habitat, the project owner shall provide a minimum of 41.5 acres of giant garter snake habitat at a CPM approved location. Any site restoration necessary to create suitable giant garter snake habitat shall be completed at the project owner's expense. The property shall be located in Sacramento County. The project owner shall provide additional monetary funds for long-term management and monitoring of the protected lands as necessary based on the Center for Natural Lands Management Property Analysis Record, or similar cost analysis program. Approval of the management plan by the CPM is required prior to ground disturbance, and restoration shall be completed prior to commercial operation.

Verification: The project owner shall submit the location of the mitigation area, the entity that shall manage the property in perpetuity and the management plan for the area to the CPM for approval. Fifteen (15) days prior to site or related facilities mobilization the project owner shall provide a copy of the check and the signed contract to the CPM. At the same time the project owner shall also provide a letter from the CPM approved land management organization stating the amount of funds received, and the amount of acres purchased in long term management.

Vernal Pool Habitat Compensation

BIO-22 To mitigate for impacts to vernal pool habitat the project owner shall provide habitat compensation at a CPM approved area for a minimum of 10.3 acres impacted by construction. The habitat area shall also be within the occupied range of California tiger salamander. The habitat compensation rates are as follows:

Total "Bank" (Acres)	Total "Non-Bank" (Acres)
20.6 Preservation **3.4 Creation**	**31.0 Preservation** **6.9 Creation**

The required habitat compensation shall consist of monetary funds for restoration and long-term management and monitoring of the protected lands as necessary. Costs shall be based on the Center for Natural Lands Management Property Analysis Record, or a similar cost analysis. Approval of the management plan by the CPM is required prior to ground disturbance, and restoration shall be completed prior to commercial operation although monitoring of success criteria may be ongoing after commercial operation is started.

Verification: The project owner shall submit the location of the mitigation area, the entity that shall manage the property in perpetuity and the management plan for the area to the CPM for approval. Fifteen (15) days prior to site or related facilities mobilization the project owner shall provide a copy of the check and the signed contract

to the CPM. At the same time the project owner shall also provide a letter from the CPM approved land management organization stating the amount of funds received, and the amount of acres purchased in long term management.

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ALTERNATIVES

Testimony of Negar Vahidi

INTRODUCTION

In this section, staff considered potential alternatives to the construction and operation of the proposed Cosumnes Power Plant (CPP). The purpose of this alternatives analysis is to describe a reasonable range of feasible alternatives that could substantially reduce or avoid any potentially significant adverse impacts of the proposed project (Cal. Code Regs., tit. 14, §15126.6; Cal. Code Regs., tit. 20, §1765). Staff analyzed different technologies and alternative sites that may reduce or avoid the potentially significant impacts associated with the CPP. Staff also analyzed the impacts that may be created by locating the project at alternative sites, and how those impacts compare to development of both the 500 MW (Phase 1) facility and the 1,000 MW (Phase 2) facility at the CPP.

The California Energy Commission (Energy Commission) does not have the authority to approve an alternative or require SMUD to move the proposed project to another location, even if it identifies an alternative site that meets the project objectives and avoids or substantially lessens one or more of the significant effects of the project. Implementation of an alternative site would require that the applicant submit a new application for certification (AFC), including revised engineering and environmental analysis (Pub. Resources Code § 25500). This more rigorous AFC-level analysis of any of the alternative sites could reveal environmental impacts, non-conformity with laws, ordinances, regulations, and standards (LORS) or potential mitigation requirements that were not identified during the more general alternatives analysis presented herein. The estimated additional time required to complete site engineering and application preparation would be one year.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

CALIFORNIA ENVIRONMENTAL QUALITY ACT

The “Guidelines for Implementation of the California Environmental Quality Act” require an evaluation of the comparative merits of “a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project.” In addition, the analysis must address the “no project” alternative (Cal. Code Regs., tit. 14, §15126.6(e)).

The range of alternatives is governed by the “rule of reason” which requires consideration only of those alternatives necessary to permit informed decision-making and public participation. The California Environmental Quality Act (CEQA) states that an environmental document does not have to consider an alternative of which the effect cannot be reasonably ascertained and of which the implementation is remote and speculative (Cal. Code Regs., tit. 14, §15126.6(a)). However, if the range of

alternatives is defined too narrowly, the analysis may be inadequate (City of Santee v. County of San Diego (1989) 214 Cal. App. 3d 1438).

SCOPE AND METHODOLOGY OF THE ALTERNATIVES ANALYSIS

The purpose of staff's alternatives analysis is to identify a reasonable range of feasible alternatives that could substantially reduce or avoid any potentially significant adverse impacts of the proposed project. To accomplish this, staff must determine the appropriate scope of analysis. Consequently, it is necessary to identify and determine the potentially significant impacts of the proposed project and then focus on alternatives that are capable of reducing or avoiding the significant impacts of the proposed project.

To prepare this alternatives analysis, staff used the following methodology:

- Identify the basic objectives of the project, provide an overview of the project, and describe its potentially significant adverse impacts.
- Identify and evaluate alternative sites.
- Identify and evaluate technology alternatives to the project, including conservation and renewable resources.
- Evaluate the impacts of not constructing the project, known as the "no project" alternative under CEQA.

PROJECT OBJECTIVES

Based on analysis of SMUD's AFC, the Energy Commission staff has determined the project's objectives as:

- Generation of approximately 1,000 MW of electricity in a location that can serve baseload electricity to SMUD's service area;
- Commercial operation of 500 MW (Phase 1) by the first quarter of 2005 and an additional 500 MW (Phase 2) at some future date; and
- Location where sufficient land (a minimum of 30 acres) and infrastructure are available for Phase 1 and Phase 2.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS

In this document, staff has identified the potential for significant environmental effects of the proposed project in the technical areas of air quality, biological resources, cultural resources, noise and vibration, transmission system engineering, visual resources, and water and soil resources. With mitigation, impacts in all of these disciplines have been found to be less than significant; however, these disciplines still provide a basis for comparison of alternative sites.

ISSUE AREAS FOUND TO HAVE LESS THAN SIGNIFICANT IMPACTS IF RECOMMENDED MITIGATION IS ADOPTED

Air Quality

Staff identified two potential air quality impacts associated with Phase 1 of the proposed project:

1. The project NO_x and VOC emissions could contribute to the existing violations of the state and the federal 1-hour ozone air quality standards. However, staff has determined that the required mitigation (in the form of emission reduction credits) would mitigate the project's (Phase 1 only) impact to a less than significant level.
2. The project's PM_{10} and $PM_{2.5}$ emissions could, if left unmitigated, contribute to violations of the state 24-hour PM10 and the federal 24-hour $PM_{2.5}$ standards, especially during the winter season. However, with the provision of offsets and the reduction of ammonia slip emissions to 5 ppm described in the staff recommended Conditions of Certification are implemented, the potential for direct and secondary particulate matter emission impacts would be reduced to a less than significant level.

With implementation of Conditions of Certification **AQ-SC1** through **AQ-SC-8**, and the District (Sacramento Metropolitan Air Quality Management District [District]) recommended Conditions of Certification **AQ-1** through **AQ-43,** air quality impacts would be less than significant. Staff has only identified enough air emission offsets for Phase 1 of the project. If and when SMUD decides to pursue Phase 2, SMUD would need to identify and provide additional air emission offsets and obtain a Determination of Compliance from the District. Therefore, staff does not recommend approval of Phase 2 at this time.

Biological Resources

The CPP has the potential to affect state- and federally- listed species and sensitive habitats at the power plant site, the construction laydown area, and along the associated linear facilities. SMUD submitted a proposed schedule for obtaining the necessary state and federal permits from U.S. Fish and Wildlife Service (USFWS), National Marine Fisheries Service (NMFS), and the California Department of Fish and Game (CDFG) for LORS compliance. Federal and state permits are being reviewed and are in process.

However, staff lacks several pieces of information necessary to conclude that the project will not create any significant adverse impacts in the area of Biological Resources. As a result, we have asked SMUD to provide this information prior to evidentiary hearings. Specifically, staff has requested that SMUD provide a revised BRMIMP with all updated mitigation measures, a restoration and revegetation plan for the gas pipeline, and additional details about the habitat compensation required for impacts to Swainson's hawks, giant garter snakes, and vernal pools. Staff believes that if the necessary information is submitted prior to evidentiary hearings, staff will be able to recommend approval of the project at the hearings.

Cultural Resources

Staff prefers that presence/absence testing, remote sensing, and site evaluation, if necessary, should be completed prior to permitting of the CPP so that staff can recommend appropriate mitigation for cultural resources sites that might be encountered during power plant development. However, since SMUD was unable to acquire access to all privately owned property prior to and during the AFC process to conduct necessary tests, staff has proposed that a treatment plan for those areas be developed.

Although the treatment plan would also include some information regarding Native American concerns, staff recommends interaction with the Native American Community pursuant to proposed Conditions of Certification **CUL-3**, **CUL-5**, **CUL-6**, and **CUL-7**. With the adoption of Conditions of Certification **CUL-1** through **CUL-9**, which incorporate these staff recommended mitigation measures, impacts to cultural resources would be less than significant.

Noise and Vibration

Energy Commission staff concludes that both phases of the CPP, with the recommended mitigation, could be built and operated to comply with all applicable noise LORS. Energy Commission staff further concludes that if the mitigation described in the proposed Conditions of Certification to reduce noise impacts is implemented, those impacts would be less than significant. Proposed Conditions of Certification **NOISE-1** through **NOISE-10** would ensure compliance with all applicable noise LORS, and ensure that the project would not result in a significant increase in ambient noise levels.

Transmission System Engineering

Staff has concluded that construction of Phase 1 of CPP would not cause stability criteria violations. However, two circuit breakers at Hedge Substation would exceed fault duty ratings and would need to be replaced before Phase 1 is added at CPP. The proposed power plant switchyard, outlet lines, and termination are acceptable and would comply with LORS assuming the proposed conditions of certification are implemented. No additional new transmission facilities, other than those proposed by the applicant, are required for the interconnection of Phase 1 of the CPP. However, staff does not recommend approval of the second 500 MW phase (Phase 2). As part of the licensing process for the Phase 2, the applicant must return to the Energy Commission with a completed System Impact Study that evaluates that phase. Therefore, with adoption of Conditions of Certification **TSE-1** through **TSE-4,** impacts to the electrical transmission system from Phase 1 of the CPP would not be significant.

Visual Resources

The proposed project structures would cause adverse but less than significant project-specific visual impacts. However, the visual effects of the proposed structures would be cumulatively considerable in combination with the ongoing adverse visual effects of the existing Rancho Seco Power Plant structures. With effective implementation of staff's proposed Conditions of Certification **VIS-2** [surface treatment] and **VIS-3** [landscape screening], the project structures' incremental visual effects would not be cumulatively considerable.

The proposed project's night lighting has the potential to cause adverse and significant project-specific visual impacts. The visual effects of the project's night lighting also have the potential to be cumulatively considerable in combination with the existing lighting at the Rancho Seco Power Plant. However, with effective implementation of staff's proposed Conditions of Certification **VIS-4** and **VIS-5,** project-specific impacts of night lighting would be less than significant and its incremental visual effect would not be cumulatively considerable.

In the three cases of inconsistency or partial consistency with applicable LORS, either the inconsistencies would initially not produce a significant visual impact, or with effective implementation of staff's proposed Conditions of Certification, the impacts causing the inconsistencies would not be significant. Effective implementation of staff's proposed Conditions of Certification **VIS-2** through **VIS-5** would eliminate one inconsistency and the one case of partial inconsistency. The one remaining inconsistency is in regard to a zoning ordinance requirement from which the project is exempt based on Government Code Section 53091.

Water and Soil Resources

Staff evaluated whether construction or operation of the project would result in accelerated wind or water erosion and sedimentation, and whether it would exacerbate potential flood conditions. Staff concludes that with implementation of the Conditions of Certification, such project impacts would be adequately mitigated.

Staff also evaluated the impact of the project's water supply. Staff did not find a direct impact, due to the fact that the project would not result in a demonstrable reduction in regional water supplies. Although regional water shortages are predicted, staff finds that the Water Forum process has addressed SMUD's potential water use in a reasonable way and concludes that the incremental effect of CPP water use is not cumulatively considerable. However, SMUD has agreed to reduce the use of surface water by using zero liquid discharge technology for Phase 1 and Phase 2, and reclaimed water for Phase 2.

Staff also found that with implementation of the proposed Conditions of Certification **Water & Soil-1** through **Water & Soil-11**, the project would comply with all applicable LORS.

SITE ALTERNATIVES

The applicant presented three sites (the Carson Ice-Generation Facility, the Procter & Gamble site, and the Campbell Soup site) in the AFC's Alternatives section (9.0). However, based on field reconnaissance of the sites and preliminary analysis of the comparative merits of these sites to the proposed CPP site, Energy Commission staff determined that two of the sites (Procter and Gamble site and Campbell Soup site) are not of sufficient size to accommodate a 500 MW or 1,000 MW power plant and would not meet the project's objectives. Therefore, these two sites have been eliminated from this analysis. For a brief discussion of the impacts associated with these applicant-proposed alternative sites, refer to the section entitled "Alternatives Eliminated From Detailed Analysis" (below). Energy Commission staff have identified two additional

alternative sites (the Lodi site and the Woodland site). The following discussion includes an analysis of potential alternative sites as well as a discussion of the alternative sites eliminated from detailed evaluation.

SCREENING CRITERIA USED TO SELECT ALTERNATIVE SITES

The following criteria were used to identify potential alternative sites:

1. The site should avoid or substantially lessen one or more of the potential significant effects of the project;
2. The site should meet most of the project objectives;
3. The site should be vacant or have a reasonable potential to become vacant;
4. The site should not conflict with land use designations or zoning;
5. The site should not be located adjacent to moderate or high density residential areas, sensitive receptors (such as schools and hospitals), or recreation areas; and
6. The site should not create significant impacts of its own.

Three alternative sites are evaluated in detail: Carson Ice-Generation site, Lodi site, and Woodland site. Please see **Alternatives Figures 1** through **9** at the end of this section for maps and photographs showing the locations of these three sites and the associated linear facilities. Following is a description of each site and a discussion of its potential environmental impacts.

The AFC describes the project as a 1,000 MW facility, Phase 1 of which entails the construction of a 500 MW power plant. Phase 2, construction of an additional 500 MW section to the power plant, may or may not be constructed. Each alternative site was evaluated for both a 500 MW generation power plant and a 1,000 MW power plant. The following issue areas were evaluated at each site because these issue areas have the greatest potential for significant impacts from power plants: air quality, biological resources, cultural resources, noise, transmission system engineering, visual resources, and water resources.

CARSON ICE-GENERATION SITE

The Carson Ice-Generation site (recommended as an alternative in the AFC) is a 55-acre site that is currently managed in accordance with the policies of the Sacramento Regional Wastewater Treatment Plant's (SRWTP) Bufferlands. The Sacramento Regional County Sanitation District (SRCSD) set aside 2,500 acres in the 1970s to serve as a buffer between the SRWTP and surrounding neighborhoods in southern Sacramento County. The SRWTP is located at 8521 Laguna Station Road in Elk Grove (see **Alternatives Figure 1**), approximately 20 miles northwest of the CPP site. The SRWTP evaporation ponds are to the west of the alternative site, the Carson Ice-Generation facility, a 95 MW peaking plant, is adjacent to the site to the north, and the Bufferlands are to the south and to the east of the site, beyond the Union Pacific Railroad, which is adjacent to the east of the site. A majority of the parcel is currently used for agriculture (SRCSD 2002a).

Although there are no current plans, the SRCSD has stated that it would like to reserve a 55-acre area for part of its planned expansion zone (SRCSD 2002a). If the SRWTP does not expand on to the site, the parcel would become a permanent part of the Bufferlands. Since the parcel is currently being managed as part of the Bufferlands,

construction of a power plant is not consistent with the County's management policy for the Bufferlands, which discourages the conversion of agricultural land or open space to permanent structures.

Nearby drainage courses include Laguna Creek, approximately 1,600 feet to the northeast of the site (note that this is not the same Laguna Creek that passes near the proposed CPP site), and Morrison Creek, which passes approximately one mile to the west of the site. Morrison Creek drains into the Sacramento River approximately two miles west of the site. Laguna Creek is a tributary to Morrison Creek. There is a small man-made drainage located along the southern boundary of the site.

According to the Sacramento County Department of Public Works, the Carson Ice-Gen site is entirely within the 100-year floodplain of Laguna Creek. Potential flood depths vary but are generally one foot or more. Based on well data available from the USGS, the depth to groundwater is approximately 60 to 70 feet. Soils are fine alluvium typical of the California central valley.

The parcel is potential habitat for Swainson's hawk (State-listed threatened species) and burrowing owl (federal and State-listed species of concern) (SRCSD 2002a). There are known Swainson's hawk nests within one-quarter mile of the site; therefore, the site is likely to be within their foraging area (SRCSD 2002a). Along the southern boundary of the parcel there is a perennially wet drainage ditch, which is potential habitat for giant garter snake, a federally-listed endangered species.

The nearest residences are found in large housing developments located less than one mile to the east, north, and south of the site (SMUD 2001a). The homes closest to the SRWTP property would likely have views of the power plant (in addition to existing views of the SRWTP, the Carson Ice-Generation facility, and other existing structures).

The SRWTP operates a 5 million gallon per day (gpd) water recycling facility adjacent to the site. The County has certified an Environmental Impact Report evaluating the production of an additional 5 million gpd, although a construction date has not been set. With the expanded recycled water facility, sufficient recycled water would be available to operate a power plant at this site (SRCSD 2002b). Since the SRWTP is adjacent to the site, installation of a short water pipeline would be required.

The site is adjacent to SMUD's existing natural gas line that terminates at the Carson Ice-Generation facility and connects to PG&E's Line 400 and 401 near Winters, California. Existing transmission lines that connect to the Carson Ice-Generation facility are 69 kV, although a double-circuit 230 kV transmission line runs north-south adjacent to the site.

Linear Facilities

Linear facilities that would be required for both a 500 MW and 1,000 MW power plant at this alternative site are described below.

Linear Facilities for a 500 MW Facility

- **Water –** This alternative analysis assumes use of recycled water for power plant cooling and plant make-up water. The pipeline for recycled water for the project would run from the SRWTP and the Carson Ice-Generation facility, cross Laguna Station Road, and run approximately 200 feet directly south to the site (**Alternatives Figure 1**). Potable water would be supplied by municipal sources.
- **Natural Gas -** The natural gas pipeline for the project would run east from the existing natural gas pipeline adjacent to the SRWTP and Carson Ice-Generation facility approximately 200 feet before turning south for approximately 100 feet along Laguna Station Road to the site (**Alternatives Figure 1**).
- **Transmission -** The existing double-circuit 230 kV transmission line adjacent to the site would likely have the capacity to be connected to a 500 MW power plant (**Alternatives Figure 1**). Depending upon the layout of the proposed power plant in relation to the existing 230 kV lines, the connection from the plant to the existing lines could require between 100 to 1,500 feet of new overhead transmission line extending east from the site, either crossing Laguna Station Road or following Sims Road. **Alternatives Figure 1** depicts a transmission line parallel to the northernmost boundary of the site and extending 1,500 feet east across Laguna Station Road to the existing transmission lines.

Linear Facilities for a 1,000 MW Facility

- **Water –** Same as for a 500 MW facility described above (see **Alternatives Figure 1**).
- **Natural Gas – Same as for a 500 MW facility described above (see Alternatives Figure 1**).
- **Transmission -** For a 1,000 MW power plant, the existing double-circuit 230 kV lines would not be adequate. A new 230 kV transmission line would be required. This analysis assumes the transmission line would extend overhead, east from the site along Sims Road, crossing Laguna Station Road, turn south and parallel the existing transmission line along the Union Pacific railroad line. The new transmission line would extend south for approximately three miles to avoid conflicts in the City of Elk Grove. The transmission line would then continue east, parallel to Bilby Road, through undeveloped land for approximately 6.5 miles to connect to the north-south SMUD 230 kV system corridor that parallels Waterman Road (**Alternatives Figure 2**).

Carson Ice-Generation Site Impact Discussion and Site Comparison

Air Quality – Potentially significant impacts, feasible mitigation available

Emissions from construction and operation of a 500 MW (Phase 1) power plant at the Carson Ice-Generation site would not be significantly different from the construction activities for the CPP site. Given the similarity in topography and meteorology between the proposed site and the alternative site, and the fact that the two sites are in the same air basin, the impacts would be similar to those calculated for the CPP project site. As the Air Quality section of this FSA only analyzes the impacts of a 500 MW facility, this alternatives analysis also only considers the impacts associated with a 500 MW facility.

The proposed power plant located at the Carson Ice-Generation site would be subject to the same air District (Sacramento Metropolitan Air Quality Management District) rules as the project located at the CPP site.

These District requirements and staff Conditions of Certification regarding construction emissions would address and mitigate to a less than significant level any potential impacts from the construction of Phase 1 at this alternative site. Therefore, air emission impacts would be similar to those of the proposed project and could be mitigated to less than significant levels.

Biological Resources – Potentially significant impacts, feasible mitigation available

The potential impacts to biological resources at the Carson Ice-Generation site would be similar for both a 500 MW or 1,000 MW facility. The site consists of primarily upland habitat that is used for foraging by species such as burrowing owls and Swainson's hawks. There are some vernal pools near the site, but staff believes that either facility could be sited to minimize or avoid any impacts to wetlands. However, there would be temporary impacts to many special-status species also impacted by CPP for the 1,000 MW plant due to construction of an approximately 9.5-mile long overhead transmission line. Construction of the transmission line would potentially cross some wetlands, vernal pools, and irrigation canals, potentially impacting giant garter snakes, western pond turtles, California tiger salamanders, and vernal pool plant species and invertebrates in addition to any species impacted at the Carson Ice-Generation site. Tower footings can be sited to avoid and minimize permanent impacts. Impacts to biological resources are mitigable with seasonal avoidance measures, siting facilities to avoid wetlands, and habitat compensation for permanent impacts.

The Carson Ice-Generation site is located close to facilities that could provide reclaimed water to the power plant for cooling and make-up water. This would eliminate any operational impacts to fisheries in the Lower American River from use of surface water for cooling. Using reclaimed water and construction of short linear facilities that do not impact stream crossings, or Essential Fish Habitat would eliminate potential impacts to fisheries.

Due to its location near existing infrastructure, many of the impacts associated with long pipeline construction, such as stream crossings, frac-outs[1], and crossing different habitat types, which would impact more species, would be reduced. Elimination of the 26-mile natural gas pipeline to the proposed CPP site would reduce impacts or potential impacts to wetland features, aquatic species in waterways, valley elderberry longhorn beetle, burrowing owls, Swainson's hawks, giant garter snakes, heritage trees, and a wide variety of other species and habitats. The Carson Ice-Generation site would avoid the need for a natural gas pipeline to cross the Cosumnes River Preserve and the impacts associated with directional drilling under Laguna Creek, Badger Creek, and the Cosumnes River (e.g., bore pits, frac-outs, etc.).

[1] A frac-out is an uncontrolled spill of drilling fluid, usually bentonite, into the environment.

This alternative site is used for agriculture and is located in previously disturbed areas. Therefore, construction of either a 500 MW or 1,000 MW facility at the Carson Ice-Generation site compared with the CPP site would reduce impacts to both federally- and state-listed species and their habitats mentioned above that would potentially be impacted by construction of the CPP. Of the proposed CPP and the other alternative sites considered in this analysis, the Carson Ice-Generation site would potentially result in the fewest impacts to biological resources.

Cultural Resources – Potentially significant impacts, feasible mitigation available

A cultural resources records search was performed for the Carson Ice-Generation site by the North Central Information Center of the California Historic Resources System (CHRIS). Only preliminary records search information is available for this alternative site. The Information Center reports numerous archaeological sites in the vicinity of this site. However, due to time constraints, a map that identifies site locations could not be obtained for inclusion in this analysis. Therefore, it cannot be determined how many previously recorded sites are near the proposed power plant site (for either a 500 MW or 1,000 MW power plant) and how many are along the proposed transmission line necessary for a 1,000 MW plant. As a whole, the Carson Ice-Generation Alternative would be located in an area that is considered to be sensitive for cultural resources.

It appears that this is an area sensitive for both prehistoric and historic resources, although the 500 MW option would likely impact fewer resources because it would not include the 26-mile long proposed natural gas transmission line route and would require a smaller plant footprint area than a 1,000 MW facility. Additional information would be needed to identify the location of numerous, previously recorded cultural resources in the vicinity of the Carson Ice-Generation Alternative. The proposed CPP project location would also be located in an area that is sensitive for cultural resources, since resources have been identified within and adjacent to the project footprint. Overall, the Carson Ice-Generation Alternative could have a similar high potential to impact cultural resources compared to the proposed project at CPP. However, as at the CPP, conditions of certification would likely reduce impacts to less than significant levels.

Noise and Vibration – Potentially significant impacts, feasible mitigation available

A power plant generally introduces a new noise source with a distinctive acoustical character, quite different from typical ambient noise. Therefore, the concerns for significant noise exposures associated with the alternative sites are determined by the proximity of sensitive receptors, ambient noise levels, and whether other factors would affect sound transmission to the sensitive receptors.

Theoretically, the noise produced by a 1,000 MW power plant could be three decibels (dB) higher than that produced by a 500 MW power plant, as the total acoustical energy of the larger plant would be twice that of the smaller plant. In practice, however, the presence of the HRSG structures, turbine buildings, cooling towers, and similar equipment would shield receptor positions from direct noise exposure, so that a second 500 MW power plant unit may produce little or no increase in the overall power plant noise level. For this analysis, it was assumed that the overall power plant noise levels would be those described for the 1,000 MW power plant, which is the basis for the noise

mitigation measures for the current 500 MW project (Phase 1). If the second 500 MW plant (Phase 2) were not constructed, the noise levels would probably not be reduced significantly, and if they were, in no case would the reduction be greater than three decibels.

Ambient noise levels in the vicinity of this site are higher than at the CPP site, due to distant traffic on Interstate 5 (I-5), traffic on Franklin Boulevard, and the existing Carson Ice-Generation facility. The adjacent lands are set aside for open space uses, and are owned by Sacramento County. The nearest homes are about 2,000 feet away, on Dwight Road. These sensitive receptors are farther from the power plant than at the proposed project site, where the nearest residence is about 800 feet away (although SMUD would relocate the residence to 3,000 feet from the CPP prior to commercial operation). At the CPP project site, the receptors are elevated above the power plant, and noise levels would not be greatly reduced by ground absorption of sound. Noise propagation from the Carson Ice-Generation site to the nearest homes would be better attenuated by the intervening ground surfaces because the source and receiver are at the same ground elevation.

Given that noise from the existing Carson Ice-Generation power plant is sufficiently controlled so that few noise complaints are received concerning its operation, it appears technically feasible to design a power plant for this site that would not result in a significant noise impact. Because mitigation appears feasible from a technical standpoint and because the ambient noise levels are higher in the vicinity of this site than at the CPP, this site would have less noise impacts than the proposed project.

Transmission System Engineering – Potentially significant impacts, feasible mitigation available

For a 500 MW generating plant, the plant could connect to an existing double-circuit 230 kV transmission line running north/south along the Union Pacific Railroad tracks adjacent to the site.

A 1,000 MW generating plant, however, would require that a new 230 kV line and switching station be constructed to connect to SMUD's existing double-circuit 230 kV lines with bundled conductors that run north to south along the Union Pacific Railroad line for approximately three miles. The line would then turn east and cross undeveloped land south of the City of Elk Grove for approximately 6.5 miles to existing 230 kV lines southeast of Elk Grove. Due to the significant amount of residential development in the area, the new transmission line connection could be significantly longer than 6.5 miles in length due to siting constraints. Although staff believes it is feasible to build transmission facilities from the Carson Ice-Generation site to connect to the SMUD 230 kV system corridor, significant problems routing a 230 kV transmission line through the City of Elk Grove are anticipated. A system impact study would need to be performed to confirm the technical and economic feasibility of such a connection, but it appears that the transmission costs for both a 500 MW and 1,000 MW plant would be significantly higher than for the CPP. This site would have greater transmission system engineering impacts than the CPP, however, mitigation to reduce these impacts to a less than significant level is feasible.

Visual Resources –Significant impacts, feasible mitigation not available

This alternative site is located in the City of Elk Grove, south of the existing Carson Ice–Generation facility on undeveloped, level Bufferlands of the Sacramento Regional County Sanitation District. The Bufferlands extend to the west of the site for approximately one mile, to the east of the site for approximately ¾-mile, and to the south for approximately ¼-mile. To the immediate north of the site is the Carson Ice-Generation facility with Bufferlands extending approximately three-quarters of a mile beyond. The site would be visible from all directions though visibility from the west and northwest would be somewhat limited by distance and vegetation screening. However, the site would be visible from existing residential developments to the north, east, and south. The closest public viewing opportunities would be from Dwight Road and the existing residential developments on the south side of Dwight Road, which is approximately ¼-quarter of a mile south of the site (see **Alternatives Figure 5**). Views from the residential developments would be direct and extended. The project structures would be within the primary cone of vision of westbound motorists on Dwight Road. The project would also have some limited visibility from Franklin Boulevard (approximately one mile to the east of the site) but these views would be at right angles to the directions of travel. The project would also have limited visibility from I-5, located approximately 1.5 miles west of the site, but these views would be partially screened by vegetation along I-5 and the structures would be well beyond the primary cone of vision of northbound and southbound travelers on I-5.

The overall visual quality of the immediate project site is low-to-moderate, reflecting a rather non-distinct agricultural landscape and the influences of the existing power generation and electric transmission infrastructure. Viewer concern is considered high, as residents to the north, east, and south would have direct lines of sight with extended viewing opportunities. These viewers would perceive the addition of prominent geometric forms with substantial mass and industrial character as an adverse visual change. Project visibility would be moderate-to-high at middle-ground viewing distances with some views limited by distance and/or screening. Overall viewer exposure would be moderate-to-high and the overall visual sensitivity of this site would be moderate.

The use of the Carson Ice-Generation alternative site for a power plant would result in the introduction of additional linear and geometric forms of industrial character. The linear forms and lines of the project would be similar to that of the existing Carson Ice-Generation and 69 kV transmission line facilities, resulting in moderate visual contrast. However, the solid geometric mass of the structures would be more prominent in the predominantly level landscape, resulting in a moderate-to-high project dominance. The project structures would result in a low-to-moderate view blockage of higher quality landscape features (including sky and vegetation) when viewed from middle-ground residential viewing opportunities. The overall visual change resulting from the use of this location would be moderate. When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the moderate visual change that would occur at this site would cause an adverse, but not significant, visual impact. This conclusion applies to both the 500 MW and 1,000 MW configurations. In order to reduce the adverse visual impact that would be experienced by residents along the south side of Dwight Road, it is recommended that trees be

planted along the north side of Dwight Road between Franklin and the western-most residential development.

Linear Facilities

The Carson Ice-Generation Facility site would include the installation of short, underground water and gas pipelines to connect to adjacent facilities. Neither the construction nor operation of these underground facilities would result in adverse visual impacts.

A 500 MW facility would connect to the adjacent existing 230 kV transmission line across Laguna Station Road via a relatively short (i.e., 100-1,500 feet long depending on the layout of the power plant) overhead transmission line. Existing residences that may be able to view the transmission line are more than ¼-mile to the north, east, and south; however, the lines would result in a low-to-moderate view blockage of the landscape. This is considered an adverse, but not significant, visual impact.

However, a 1,000 MW facility would also require the construction of an approximately 10-mile overhead 230 kV transmission line. This new transmission line would pass through existing, dense residential development and adjacent to new residential construction along Franklin Road. **Alternatives Figure 6** shows the existing view from a major new subdivision that is currently under construction along the east side of Franklin Road, just south of Elk Grove Boulevard. In the urban areas of the route, the new transmission line would pass immediately adjacent to residential areas, resulting in moderate-to-high degrees of visual change. When considered within the context of the moderate-to-high sensitivity of the existing landscape and viewing characteristics, project-induced visual change would cause adverse and significant visual impacts, which could not be mitigated. The east-west portion of the route between the community of Franklin Road and Waterman Road would pass through primarily open, agricultural areas with scattered rural residences. There are few industrial or vertical forms in this level agricultural landscape and limited screening of the route. The new transmission line would result in a high degree of visual change. When considered within the context of the moderate-to-high sensitivity of the existing landscape and viewing characteristics, project-induced visual change would cause adverse and significant visual impacts. These impacts could not be mitigated. This alternative site would result in significant visual impacts from project structures and has greater visual resources impacts compared to the proposed CPP, which would not result in significant visual impacts from project structures.

Visible Plumes

It is assumed that a power plant at the Carson-Ice Generation site would generate a vapor plume with approximately the same frequency as the CPP. For both the 500 MW and 1,000 MW power plants, the use of the Carson Ice-Generation site for a power plant would result in the introduction of a new source for intermittent water vapor plumes that would appear similar to that of the existing Carson Ice-Generation facility, resulting in moderate visual contrast. However, the addition of another plume would result in greater plume prominence in the predominantly level landscape, resulting in moderate dominance (co-dominant features in the view). View disruption from the plume would be low, as there are no high quality features that would be blocked from the middle-

ground residential viewing opportunities. The overall visual change resulting from the use of this site would be low-to-moderate. When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the low-to-moderate visual change that would occur at this site from the plume would cause an adverse but not significant visual impact. Therefore visible plume impacts are similar to the proposed project.

Water and Soil Resources – Potentially significant impacts, feasible mitigation available

Drainage/Flooding

A power plant project (both 500 and 1,000 MWs) at the Carson Ice-Generation site would be subject to flooding from Laguna Creek unless protected. Sacramento County requires the lowest floor of any buildings or other improvements potentially subject to flood damage be elevated at least one foot above the 100-year flood level.

Consequently, assuming one-foot flood depth, a 25-acre power plant at this site would require the import of 40,000 to 80,000 cubic yards of fill for flood protection. Alternately, a levee around the site could provide 100-year flood protection. A levee would require at least 3 feet of freeboard, resulting in a total levee height of approximately 4 feet or more. A levee may be less favorable than fill as levees are more prone to damage, and are difficult to drain from the inside. Whether protected by fill or a levee, access to the site may be limited during periods of flooding unless the access roads are also raised.

In comparison to the proposed CPP site, the Carson Ice-Generation site would be subject to greater risk of flood-related impacts. The entire site is within the floodplain, as opposed to approximately 15% of the CPP site. As with the proposed CPP site, a power plant (both 500 and 1,000 MWs) at the Carson Ice-Generation site could be made safe from 100-year flooding by elevating on fill, but there would still be a higher risk of damage by larger floods than at the CPP site.

The gas and water lines for the Carson Ice-Generation site would not cross any hydrologic resources of significance. The transmission line would cross several minor, local drainage ways. With the exception of the transmission line, which could avoid water resources by siting the towers in dry areas, the linear features would have no impact on water resources. By comparison, the 26-mile gas pipeline required for the CPP site would cross a number of watercourses and wetlands including the Cosumnes River.

Stormwater/Surface Water Quality

Stormwater impacts would be similar to those of the CPP. Best management practices (BMPs) similar to the proposed CPP would be required for stormwater quality. Water quality BMPs may include a detention basin as proposed for the CPP. The basin would likely drain to a local drainage channel running along the south side of the site, and eventually into the Sacramento River via Morrison Creek.

Groundwater/Soils

Soils impacts are expected to be similar to those of the proposed CPP, with the exception of the linear features. At the Carson Ice-Generation Site, impacts would be substantially reduced because of the shorter natural gas pipeline required.

The proximity of the SRWTP would allow treatment of sanitary wastes rather than using a leach field, resulting in less potential for groundwater impact than the CPP.

Water Use/Supply

It is anticipated that the SRWTP would supply reclaimed water for cooling at a plant at this site. This water source would be consistent with State Water Resources Control Board Resolution 75-58. Water use impacts would be greater for the CPP than the Carson Ice-Generation alternative site. Water use is expected to be similar to the CPP for Phase 2.

LODI SITE

The Lodi site was identified by staff and is a 52-acre site located on North Thornton Road, southwest of the City of Lodi and approximately one-half mile west of I-5, south of Frontage Road (see **Alternatives Figure 3**). The site is located in San Joaquin County, approximately 30 miles southwest of the proposed CPP site. The site is west of the Northern California Power Authority's (NCPA) 50 MW Combustion Turbine No. 2 project and south of the White Slough Water Pollution Control Facility (WSWPCF). It is accessible via existing paved roads. The City of Lodi owns approximately 1,000 acres in the area, 30 acres of which are used by the WSWPCF and 900 acres of which are leased to local farmers for agricultural uses. The WSWPCF is currently screened from views from I-5 and other roadways to the east by a row of mature trees along the plant's eastern boundary. These trees would also provide some screening for a power plant.

The site is located in San Joaquin County (see **Alternatives Figure 3**), approximately 30 miles southwest of the proposed CPP site. The site is zoned Public and currently used for agriculture. However, the City of Lodi is willing to negotiate other uses for the land (WSWPCF 2002).

Upgrades or reinforcement of the existing roads would likely be required to support heavy load trucks during construction. Based on information provided by the WSWPCF and the San Joaquin County Department of Public Works, groundwater is very shallow and is at approximately 5 feet below the surface at this site. Soils are fine alluvium typical of the California central valley. According to the San Joaquin County Department of Public Works, the property is entirely within the floodplain of White Slough and possibly Bishop Cut. The 100-year flood depth is approximately 3 feet. Therefore, it would require a substantial amount of fill to raise the site above the 100-year floodplain (WSWPCF 2002).

Nearby drainage courses include White Slough and Bishop Cut, both located approximately 1.2 miles to the west of the project site. One of the ponds of the White Slough Wildlife Area (WSWA) is located approximately 1,500 feet west of the project site.

A 20-acre parcel used for agriculture exists between the alternative site and the WSWA. The WSWA is under the jurisdiction of the California Department of Water Resources but is managed by the California Department of Fish Game. The WSWA land adjacent to the City of Lodi property line contains unconnected canal ponds that are frequented by recreational fishermen. In addition, the WSWPCF evaporation ponds are located northeast of the site and are frequented by birdwatchers throughout the year because the ponds are heavily used by migratory waterfowl (WSWPCF 2002). The nearest residential receptors are more than a mile away, beyond the agricultural fields to the east. As such, the nearest residential receptors likely would not be able to see or hear a new energy facility at this site, as its view would be screened by the existing industrial facilities, existing vegetation, and I-5.

The WSWPCF adjacent to the site produces sufficient un-disinfected secondary-treated recycled water to meet the cooling needs of a power plant comparable to a 1,000 MW CPP, although additional treatment would be necessary. Recycled water from the WSWPCF is currently used by agriculture in the summer months, but this agreement could be changed to supply a power plant year round.

Four existing 230 kV transmission lines are located at the northeast corner of the Lodi site. The lines would be easily accessible to the power plant. The eastern-most lines are a double-circuit transmission line owned by PG&E. The western-most lines are two single-circuit transmission lines owned by the Western Area Power Administration (WAPA). The plant could connect to either the PG&E or WAPA lines and transfer power to the SMUD system at the Elk Grove Substation, approximately 20 miles north of the Lodi site.

Linear Facilities

Linear facilities that would be required for both a 500 MW and 1,000 MW power plant at this alternative site are described below.

Linear Facilities for a 500 MW Facility

- **Water –** This analysis assumes use of recycled water for power plant cooling and make-up water. Recycled water could be provided to the plant by means of a pipeline to the WSWPCF. **Alternatives Figure 3** shows the pipeline extending approximately 100 feet north from the WSWPCF before turning southwest for approximately 1,000 feet along an existing private road to the eastern boundary of the site (WSWPCF, 2002). Potable water would be provided by municipal sources.
- **Natural Gas –** While the natural gas pipeline serving the NCPA facility and WSWPCF does not have sufficient capacity to supply a 500 MW power plant, a Lodi Gas Storage, LLC, 30-inch natural gas pipeline with capacity for lease is located approximately 2 miles north of the alternative site, parallel to State Route (SR) 12 (LGS 2002). This analysis assumes that a 24-inch pipeline would be installed from the Lodi Gas Storage pipeline to the site. The pipeline would parallel I-5 south outside of the I-5 ROW for approximately 2.25 miles, then continue west for approximately 0.5 miles to the Lodi Alternative site. (see **Alternatives Figure 3**).

Alternately, a natural gas line could be installed from the PG&E Line 108 located approximately 3.5 miles east of the alternative site, but a pipeline to the Lodi Gas Storage, LLC, pipeline is shorter, thus having less ground disturbance impacts.

Additionally, the PG&E Line 108 would likely require reinforcement to the serve a 500 or 1,000 MW power plant (PG&E 2002).

- **Transmission –** Either the PG&E or WAPA lines located along the northeast portion of the alternative site could connect to a 500 MW energy facility. Two or three of the lines would need to be connected to the plant to accommodate a 500 MW generating plant (**Alternatives Figure 3**). An agreement and wheeling charge would need to be coordinated between SMUD and PG&E and/or WAPA for the 500 MWs to be routed to the SMUD system.

Linear Facilities for a 1,000 MW Facility

- **Water -** The WSWPCF could supply enough un-disinfected secondary-treated recycled water to cool a 1,000 MW facility. The pipeline alignment would be the same as described for the 500 MW facility (WSWPCF 2002). Potable water would be provided by municipal sources.
- **Natural Gas –** The Lodi Gas Storage, LLC, pipeline has available space in the pipeline for lease to transport natural gas to the site for a 1,000 MW facility (LGS 2002). A 24-inch pipeline would be installed to the site from the Lodi Gas pipeline near SR 12 as described for the 500 MW facility (**Alternatives Figure 3**).
- **Transmission –** Both the PG&E or WAPA lines located along the northeast portion of the alternative site could connect to a 1,000 MW energy facility. The energy plant would need to connect to all four of the PG&E or WAPA lines located along the northeast portion of the site to accommodate 1,000 MW of transmission (**Alternatives Figure 3**). An agreement and wheeling charge would need to be coordinated between SMUD and PG&E and WAPA for the 500 MWs to be routed to the SMUD system.

Lodi Site Impact Discussion and Site Comparison

Air Quality – Potentially significant impacts, feasible mitigation available

Emissions from construction and operation of a 500 MW (Phase 1) power plant at the Lodi site would not be significantly different from the construction activities for the CPP site. Given the similarity in topography and meteorology between the proposed site and the alternative site, and the fact that the two sites are in the same air basin, the impacts would be similar to those calculated for the CPP project site. As the Air Quality section of this FSA only analyzes the impacts of a 500 MW facility, this alternatives analysis also only considers the impacts associated with a 500 MW facility.

The project's operating emissions and site topography could be modeled to determine specific impacts. The proposed project located at the Lodi site would be subject to the San Joaquin Valley Unified Air Pollution Control District rules, which could require different offsets than those for the proposed project, which is in the SMAQMD. However, rule compliance coupled with the similarity between the sites and emissions profiles, staff expects the project's impacts would be similar to the project located at the CPP site.

The implementation of the District and staff Conditions of Certification regarding construction emissions would address and mitigate to a less than significant level any

potential impacts from the construction of a 500 MW facility at this alternative site. Any potential air emissions from the operation of the project at this alternative site would be modeled for impacts and mitigated or offset, as appropriate. However, the Lodi site could require a different offset package than that proposed for the CPP site. Air emission impacts would be similar to those of the CPP and could be mitigated to less than significant levels.

Biological Resources – Potentially significant impacts, feasible mitigation available

Since the site is used for agriculture, there may be minimal impacts to special-status plants, but the area is potential giant garter snake and Swainson's hawk foraging habitat. The site is close to the WSWA, which is also habitat for wintering greater sandhill cranes and waterfowl.

This alternative has relatively short linear facilities and would have no significant impacts on stream crossings, or vernal pools. The Lodi site is located close to facilities that could provide reclaimed water to the power plant.

At this time there is a captive-breeding program for riparian brush rabbits near this proposed alternative. The Endangered Species Recovery Program, at California State Stanislaus, under guidance from the USFWS, operates and manages this program with several partner agencies. This program could last another 3-5 years. Power plant construction activities could have short-term adverse impacts on the program.

Because trees are present both east of the WSWPCF and along White Slough just west of the site, predator perching opportunities already exist on both sides of the site, thereby making this site poor quality San Joaquin kit fox habitat. Additional screening of the alternative site may be required, however, any new trees would present only an incremental increase in perching opportunities. The impacts to federally- and state-listed species could be mitigated through avoidance and minimization measures and habitat compensation for permanent impacts.

Use of reclaimed water instead of surface water for power plant cooling would eliminate any operational impacts to fisheries in the Lower American River. Using reclaimed water and construction of linears that would not significantly impact stream crossings or Essential Fish Habitat, would not impact fisheries. Due to its location near existing infrastructures, many of the impacts or potential impacts associated with the 26-mile natural gas pipeline of the CPP, such as stream crossings, frac-outs, and crossing different habitat types which impacts more species, would be reduced. The Lodi site also avoids the Cosumnes River Preserve and the impacts associated with directional drilling under Laguna Creek, Badger Creek, and the Cosumnes River (e.g., bore pits, frac-outs, etc.).

More analysis is needed to determine whether there would be a significant impact to the riparian brush rabbit captive breeding program or WSWA, and whether mitigation is available. Because of its location on disturbed land, construction of either a 500 MW or 1,000 MW power plant at the Lodi site, compared with the CPP would result in substantially fewer impacts to habitat and species. As mentioned above, the shorter

linear facilities would also reduce potential impacts during stream crossings (frac-outs) and result in few temporary construction impacts. Having permanent facilities in close proximity to a wildlife area may be a significant impact, but overall, the Lodi site would have fewer impacts to biological resources than the proposed project.

Cultural Resources – Less than significant impacts

A cultural resources records search was performed for the Lodi alternative site by the Central California Information Center of CHRIS. Only one small cultural resource survey has been completed adjacent to the Lodi site and two small surveys have been completed along the gas line route. No cultural resources were recorded as a result of these surveys. The area is not considered sensitive for historic cultural resources because its low topographic elevation (4 to 7 feet above sea level) makes it an unlikely location for habitation due to historic flooding. No rural settlement has been identified in this area (General Land Office 1867). Native Americans generally have not established settlements in frequently flooded areas.

This potential for flooding in the area makes it unlikely that archaeological resources would be encountered if a power plant and linear facilities were constructed at the Lodi alternative site. The proposed CPP site and associated linear facilities are located in areas that are sensitive for cultural resources. Resources have been identified within and adjacent to the project footprint and natural gas pipeline. Compared with the CPP, the Lodi alternative site has less potential to affect cultural resources.

Noise and Vibration – Less than significant impacts

As with the Carson Ice-Generation site, it was assumed that the overall power plant noise levels would be those described for the 1,000 MW power plant as the noise levels for a 500 MW plant would probably not be significantly less, and if they were, would not be more than three decibels lower.

Ambient noise levels in the vicinity are relatively high due to traffic on I-5 and the operation of the NCPA energy facility. The nearest homes are located east of I-5, and would not be expected to experience significant noise exposure from the power plant. Therefore, the Lodi site would have no significant noise impacts and overall fewer noise impacts than the proposed project.

Transmission System Engineering – Potentially significant impacts, feasible mitigation available

It appears feasible to connect either a 500 MW or a 1,000 MW power plant to the existing 230 kV transmission system corridor at the Lodi site. However, a 230 kV switching station would be necessary at the Lodi site to connect the plant to all four of the 230 kV lines for a 1,000 MW plant, or to two or three of the four lines for a 500 MW plant. The breakers at the existing 50 MW NCPA plant (connected to the 230 kV system near the Lodi site) would probably need replacement due to increased fault duty. There may be transmission constraints or other significant issues raised by PG&E, the ISO, and possibly WAPA in order to deliver the power into the SMUD system. A system impact study would need to be performed to confirm technical and economic feasibility. In addition, transmission costs associated with adding either 500 MW or 1,000 MW at this site are expected to be significantly higher than at the

proposed CPP site due to the cost of the 230 kV switching station and the breaker replacements. This site has greater transmission system engineering impacts than the proposed project, however, mitigation to reduce these impacts to a less than significant level is feasible.

Visual Resources – Potentially significant impacts, feasible mitigation available

The Lodi site is located immediately west of I-5 between SR-12 to the north and Eight Mile Road to the south. The site is located adjacent to the City of Lodi's White Slough Pollution Control Plant and the Northern California Power Authority's (NCPA) 50 MW Combustion Turbine project. The site is currently grass-covered land and was previously used for agricultural purposes. There are also two 230 kV transmission lines adjacent to the site. The regional landscape is defined by the flat landform of the San Joaquin Valley floor and is rural-agricultural in character. As a result, the site is highly visible from both north and southbound directions of travel on I-5 and from substantial distances in all directions from the project site. The nearest residences are over one mile to the southeast of the site and on the east side of I-5.

The overall visual quality of the immediate project site is low-to-moderate, reflecting the influence of nearby electric transmission infrastructure, the NCPA power plant, the dominance of the I-5 transportation infrastructure, and the relatively non-distinct character of the surrounding agricultural lands (see **Alternatives Figure 7**). Viewer concern is rated moderate as travelers on I-5 anticipate open, panoramic views of a predominantly non-distinct agricultural setting with the noticeable presence of power transmission and generation facilities. However, the addition of prominent geometric forms with significant mass that block views to the southwest to northwest from I-5 (the primary viewing opportunity) would be perceived as an adverse visual change. Project visibility would be high in the foreground of views from I-5. The number of viewers would be high and the duration of view would be moderate-to-extended. Overall viewer exposure would be high. While the overall visual sensitivity of the existing landscape and viewing characteristics is rated moderate, it is important to note that the high viewer exposure from motorists traveling on I-5 that occurs at this site results in the visual sensitivity rating to be at the high end of the moderate range.

The use of this location for a power plant would result in the introduction of linear and geometric forms of industrial character. The linear forms and lines of the project would be similar to that of the adjacent electric transmission infrastructure and the solid geometric mass of the structures would be similar to the adjacent WSWPCF and the NCPA 50 MW power plant though substantially larger. However, the dominant character of the project site and region is that of rural agricultural uses. The resulting visual contrast would be moderate-to-high. The project would be the dominant form in the project vicinity and view blockage of the agricultural lands to the west of I-5 would be moderate. The overall visual change resulting from the use of the Lodi alternative site would be moderate-to-high. When considered within the context of the overall moderate visual sensitivity of the existing landscape and viewing characteristics, the moderate-to-high visual change that would occur at this site would cause an adverse and significant visual impact. This conclusion is substantially influenced by the high degree of viewer exposure from I-5 motorists that would occur at this site. This

conclusion applies to both the 500 MW and 1,000 MW configurations. It may be possible to mitigate the significant visual impact to a less than significant level.

Linear Facilities

The Lodi site would include the installation of a short, underground water pipeline to connect to the nearby WSWPCF facilities and an approximately 2.5-mile underground gas pipeline, which would be adjacent to I-5 to the Lodi Gas Storage pipeline. Neither the construction nor operation of these underground facilities would result in adverse visual impacts.

Visible Plumes

The production of frequent and sizable plumes at this location would introduce prominent industrial features that would be visible from local and regional vantage points at substantial viewing distances. Because of the number of viewers with unobstructed views of the plumes, the resulting visual impact would likely be adverse and significant. However, effective implementation of mitigation measures (i.e., plume abatement) could reduce the visual impact of vapor plumes at the Lodi site to a level that would not be significant. Therefore, with mitigation, neither the alternative site nor the proposed project would result in significant visual impacts from project plumes.

Water and Soil Resources – Potentially significant impacts, feasible mitigation available

Drainage/Flooding

A power plant project at the Lodi site would be subject to flooding from White Slough unless protected. The lowest floor of any buildings or other improvements potentially subject to flood damage would have to be elevated at least one foot above the 100-year flood level. Assuming three feet of flooding, a 25-acre power plant at this site would require the import of 120,000 to 160,000 cubic yards of fill for flood protection. If protected by a levee, a levee approximately 6 feet or more in height would be required. Access to the site may be limited during periods of flooding unless the access roads are also raised.

The Lodi site is subject to substantially greater flood risk than the CPP site. A power plant at this site could be made safe from 100-year flooding by elevating on fill, but there would still be a risk of damage by floods larger than the 100-year.
The gas pipeline for the Lodi site would cross several minor, local drainages adjacent to I-5. The water line would not cross any watercourse of significance. Impacts to water resources from linear facilities would be substantially less than for the CPP.

Stormwater/Surface Water Quality

Similar to CPP, a detention basin may be required for stormwater quality. The basin would likely drain to White Slough, which is used as a wildlife refuge.

Groundwater/Soils

Soils impacts for the Lodi site would be similar to those of the proposed CPP. Impacts to soils and groundwater resulting from linear features would be substantially less for

the reason that the linear features for the Lodi site would be substantially shorter and disturb fewer water bodies in comparison to the CPP. The proximity of the WSWPCF would allow treatment of sanitary wastes rather than using a leach field, resulting in less potential for groundwater impact than the CPP. The high groundwater table could cause some difficulties in construction, but since the site would be raised by fill to a depth of approximately 3 or 4 feet, construction of a power plant should be feasible.

Water Use/Supply

The WSWPCF would supply all cooling and plant make-up water for the Lodi site alternative. This cooling water source would be consistent with State Water Resources Control Board Resolution 75-58. Water use impacts would be greater for the proposed project than for the Lodi site due to the use of fresh inland water for Phase 1.

WOODLAND SITE

The Woodland site is located on a 40-acre site approximately ½-half mile south of I-5 and approximately one mile east of County Road 102 (see **Alternatives Figure 4**). The site is over 50 miles northwest of the CPP site located off of Gibson Road, outside of the City of Woodland, in Yolo County. The Woodland site is a vacant parcel within the 2,500 acres owned by the City of Woodland, adjacent to the Water Pollution Control Facility (WPCF).

Although the site is located within the boundary of the WPCF and is accessible via existing paved roads, upgrades or reinforcement of the existing roads would likely be required to support heavy load trucks for construction of a power plant. The water table is within a few feet of the surface (City of Woodland 2001). Soils are silty clay loams and clays comprised of fine alluvium formed in floodplain basins. The Woodland site is within the 100-year floodplain of Cache Creek and Willow Slough (City of Woodland 2002a). The 100-year flood depth is 4 feet or greater. It would be necessary to import fill to raise the site above the 100-year floodplain.

Nearby waterways include Cache Creek, approximately one mile north of the property, Willow Slough, approximately 1.5 miles south of the property; and a constructed local drainage way that parallels the west side of the property. The site drains to Cache Creek, which ultimately discharges into the Sacramento River.

The site is zoned Open Space and is disturbed, but currently vacant. Agricultural land lies to the north, south, and east of the site. The land to the west is used for industrial treatment processing (City of Woodland 2002b).

The nearest residential sensitive receptor is a large residential development (Gibson Ranch) located approximately one mile west of the site, immediately west of County Road 102.

Linear Facilities

Linear facilities that would be required for both a 500 MW and 1,000 MW power plant at this alternative site are described below.

Project Linears for both 500 and 1,000 MW Facilities

- **Water –** The CPP requires approximately 1,651 gpm for proposed operation of a 500 MW power plant and 3,302 gpm for a 1,000 MW facility. The WPCF can provide 4,861 gpm of recycled water for power plant cooling and plant make-up. Additionally, the City of Woodland is currently planning for expansion of the facility in the future (City of Woodland 2002). A north-south reclaimed water pipeline that connects directly to the WPCF located along the western border of the site could provide water for the project (see **Alternatives Figure 4**). By connecting to this pipeline, no additional new water pipelines would be required outside the site. (City of Woodland 2002). Potable water would be provided by municipal sources.
- **Natural Gas -** PG&E's gas transmission Line 172 is located approximately one mile west of the Woodland site, parallel to County Road 102, with enough natural gas sufficient to support a 1,000 MW power plant (PG&E 2002). A natural gas pipeline could be constructed from Line 172, extending from the intersection of Gibson Road and County Road 102, east to Leake Road, and then north to the Woodland site. (**Alternatives Figure 4**) (PG&E 2002).
- **Transmission -** The nearest SMUD transmission system lines with capacity adequate to serve a power plant at the Woodland site are over 14 miles to the east, across the Sacramento River. A direct transmission line route to this corridor would require a river crossing, crossing a flight path to the Sacramento Airport, and would likely conflict with new residential developments being constructed along or near the route. Due to feasibility issues, the route would not likely be used.

By contrast, however, the 500 kV PG&E Table Mountain–Tesla transmission line is located approximately 2 miles east of the Woodland site, which has adequate capacity to serve either a 500 MW or a 1,000 MW power plant. A new overhead 230 kV transmission line would be required to connect to the existing PG&E Table Mountain–Tesla 500 kV line. An agreement and wheeling charge would need to be coordinated between SMUD and PG&E for the power to be routed to the SMUD system. This new transmission line is assumed to connect from the northeast corner of the site and extend approximately 2 miles due east, approximately ¼-mile south of and parallel to I-5 to the existing 500 kV line (**Alternatives Figure 4**). This transmission route would be preferred to connect the Woodland site.

Woodland Site Impact Discussion and Site Comparison

Air Quality – Potentially significant impacts, feasible mitigation available

Emissions from construction and operation of a 500 MW (Phase 1) power plant at the Woodland site would not be significantly different from the construction activities for the CPP site. Given the similarity in topography and meteorology between the proposed site and the alternative site, the impacts would be similar to those calculated for the CPP project site. As the Air Quality section of this FSA only analyzes the impacts of a 500 MW facility, this alternatives analysis also only considers the impacts associated with a 500 MW facility.

The project's operating emissions and site topography could be modeled to determine specific impacts. The proposed project located at the Woodland site would be subject to Yolo-Solano Air Quality Management District rules, which are very similar to

Sacramento Metropolitan Air Quality Management District's rules. Rule compliance, coupled with the similarity between the sites and emissions profiles, should result in project impacts similar to the proposed project located at the CPP site.

The implementation of the District and staff Conditions of Certification regarding construction emissions would address and likely mitigate to a less than significant level any potential impacts from the construction of the proposed project at this alternative site. Any potential air emissions from the operation of the proposed project at this alternative site would be modeled for impacts and mitigated or offset, as appropriate. Therefore, air emission impacts could be mitigated to less than significant levels and impacts would be similar to those of the proposed project.

Biological Resources – Potentially significant impacts, feasible mitigation available

Elimination of the 26-mile natural gas pipeline needed for the CPP would reduce the degree of impacts or potential impacts to wetland features, aquatic species in waterways, valley elderberry longhorn beetle, burrowing owls, Swainson's hawks, giant garter snakes, heritage trees, and a wide variety of other species and habitats. However, the Woodland site is potential Swainson's hawk foraging habitat, which could also potentially have nests within a few hundred feet of the proposed site. The site is also potential giant garter snake and burrowing owl habitat. Nearby Willow Slough and the Willow Slough Bypass also provide habitat for Swainson's hawks, burrowing owls, and giant garter snakes, so habitat for these species would not be completely removed from this area with this alternative.

The Woodland site is located close to facilities that could provide reclaimed water to the power plant. This would eliminate any potential operational impacts to fisheries in the Lower American River from use of surface water as cooling water. Using reclaimed water and construction of short linear facilities that would not impact stream crossings or Essential Fish Habitat would result in no fisheries impacts.

Due to its location near existing gas and water infrastructure, many of the impacts associated with the CPP's 26-mile long proposed natural gas pipeline, such as stream crossings, frac-outs, and crossing different habitat types which impacts more species, would be reduced. The Woodland site also avoids the Cosumnes River Preserve, and the impacts associated with directional drilling under Laguna Creek, Badger Creek, and the Cosumnes River (e.g., bore pits, frac-outs, etc.). The new transmission lines should be sited to avoid impacts to birds from collision and electrocution, or mitigation developed to reduce impacts to a less than significant level.

Any impacts to biological resources could be mitigated with seasonal avoidance of nesting Swainson's hawks and habitat compensation for permanent impacts on other species. Construction of either a 500 MW or 1,000 MW power plant at this site would result in large temporary impacts to habitat from construction of the new transmission lines, but would result in fewer permanent impacts than the proposed CPP. The transmission line towers would be sited to avoid impacts to sensitive habitats. Therefore, the Woodland site would likely have fewer biological resource impacts than the proposed project.

Cultural Resources – Less than significant impacts

A cultural resources records search was performed for the Woodland site by the North-west Information Center of CHRIS. The records search indicates that about half of the area proposed for the power plant site and the land that would be traversed by the linear routes has been surveyed for cultural resources. The area is not considered sensitive for historic cultural resources because of the area's past flooding events. Native Americans generally have not established settlements in frequently flooded areas.

Historic maps indicate there was a house at the west end of the proposed gas line route (General Land Office 1858). The almost total absence of dwellings indicates that historic resources are not likely to be encountered in this area. Although the area may have been more desirable for human habitation than the Lodi site, it is not a likely location for prehistoric human habitation.

This potential for flooding in the area makes it unlikely that archaeological resources would be encountered if a power plant and linear facilities were constructed at the Woodland alternative site. The proposed CPP site and associated linear facilities are located in areas that are sensitive for cultural resources. Resources have been identified within and adjacent to the CPP footprint and associated natural gas pipeline. Compared with the CPP, the Woodland site has less potential to affect cultural resources.

Noise and Vibration – Less than significant impacts

As with the other alternative sites, it was assumed that the overall power plant noise levels would be those described for the 1,000 MW power plant as the noise levels for a 500 MW plant would probably not be significantly less, and if they were, in no case would the reduction be more than three decibels.

Ambient noise levels in the immediate vicinity of this site are relatively low. The dominant noise source is distant traffic on I-5. There are no homes or other sensitive receptors within about 5,000 feet of the site. A residential subdivision is located about 5,000 feet west of the project site, on the west side of County Road 102 at Gibson Road. Ambient noise levels at this subdivision are relatively high due to local traffic. Given the distance to the sensitive receptors, and the noise levels projected for the proposed project, it is not likely that noise from this site would result in significant noise effects. Therefore, the Woodland site would have fewer noise impacts than the proposed project.

Transmission System Engineering – Potentially significant impacts, feasible mitigation available

For both a 500 MW or 1,000 MW power plant, the most feasible means for transmitting 500 MW or 1,000 MW from the Woodland site would be to connect to the existing PG&E Table Mountain–Tesla 500 kV line with ratings of 2310 MVA (normal) and 3464 MVA (emergency), which is less than 2 miles from the site. This would avoid potential routing problems that would likely be encountered when connecting the Woodland site facility to

SMUD's system line located 14 miles to the east. The power would be delivered through PG&E and the Independent System Operator.

To connect to PG&E's Table Mountain-Tesla 500 kV line less than 2 miles away would result in greater impacts to transmission system engineering than that of the proposed CPP, however, mitigation to reduce these impacts to a less than significant level is feasible.

Visual Resources – Significant impacts, feasible mitigation not available

The Woodland site is located ¼-mile south of I-5 and one mile east of County Road 102, outside the City of Woodland. The site is located adjacent to the WPCF. The site is currently grass-covered land and was previously used for agricultural purposes. In addition to several structures at the WPCF, there is also a wood pole electricity distribution line that extends north-south adjacent to the site. The regional landscape is defined by the flat landform of the Sacramento Valley floor and is rural-agricultural in character. As a result, the site is highly visible from both north and southbound directions of travel on I-5 and from a large residential development located along County Road 102, one mile west of the site (see **Alternatives Figure 8**).

Although the agricultural lands in the immediate vicinity are generally non-distinct, overall visual quality of the project site is rated moderate reflecting the lack of development that has occurred south of I-5 and the availability of unobstructed panoramic views across the valley floor. Viewer concern is rated moderate-to-high as both residents of the nearby residential subdivision and travelers on I-5 would perceive the addition of prominent geometric forms with significant mass and industrial character into a landscape generally lacking those features as an adverse visual change. Project visibility would be high in the foreground of views from I-5 and moderate from middleground views from County Road 102 and the residential development. The number of viewers would be high for I-5 and moderate for County Road 102 and the subdivision. The duration of views would range from moderate to extended depending on viewing location. Overall viewer exposure would range from moderate-to-high for County Road 102 and the subdivision to high for I-5. The overall visual sensitivity of the existing landscape and viewing characteristics would be moderate-to-high.

The use of the Woodland site for a power plant would result in the addition of linear and geometric forms of industrial character into an agricultural landscape. These structural characteristics would be unique in the landscape and would result in moderate-to-high to high degrees of visual contrast depending on viewing location, and a co-dominant to dominant project dominance. View blockage of the surrounding agricultural terrain and sky would range from low-to-moderate to moderate. The overall visual change resulting from the use of this alternative site would be moderate-to-high. When considered within the context of the overall moderate-to-high visual sensitivity of the existing landscape and viewing characteristics, the moderate-to-high visual change that would occur at this site would cause adverse and significant visual impacts. This conclusion applies to both the 500 MW and 1,000 MW configurations. It may be possible to mitigate the significant visual impact to a less than significant level.

Project Linears

The Woodland site would include the installation of an approximately 1.2-mile, underground gas pipeline to connect to facilities at the intersection of Gibson Road and County Road 102. Neither the construction nor operation of the underground gas line would result in adverse visual impacts. However, this alternative would also require the construction of an approximately 1.75-mile 230 kV transmission line. The line would extend east from the site to connect with an existing north-south 500 kV transmission line. This new transmission line would pass through open agricultural lands that are highly visible from both north and southbound I-5 (see **Alternatives Figure 9**). There are no other substantial built forms in this level agricultural landscape. The high degree visual contrast, co-dominant-to-dominant structural presence, and moderate view blockage that would be caused by the transmission line would cause a moderate-to-high degree of visual change and an adverse and significant visual impact. This impact could not be mitigated. Visual impacts would be greater compared to the proposed project, which would not result in significant visual impacts from project structures. This finding is true for either a 500 MW or 1,000 MW facility.

Visual Plumes

For either the 500 MW or 1,000 MW power plant, the use of the Woodland site for a power plant would result in the introduction of intermittent, prominent visible plumes into an agricultural landscape. The plume would be unique in the landscape and would result in a high degree of visual contrast on clear days, and would be co-dominant to dominant to the viewer depending on distance. View disruption of the sky would be low. The overall visual change resulting from the use of this site would be moderate. When considered within the context of the overall moderate-to-high visual sensitivity of the existing landscape and viewing characteristics, the moderate visual change that would occur at the Woodland site from the plume would cause adverse but not significant visual impacts. Though this site has the greatest visible plume impacts of the alternative sites, overall impacts from visible plumes are similar to the proposed project, which would not result in significant visual impacts.

Water and Soil Resources – Potentially significant impacts, feasible mitigation available

Drainage/Flooding

A power plant at the Woodland site would be subject to flooding from Cache Creek and Willow Slough unless protected by fill or levee. Assuming four feet of flooding during a 100-year storm event, a 25-acre power plant at this site would require the import of 160,000 to 200,000 cubic yards of fill to elevate the site and lowest floors to or one foot above the 100-year flood elevation. A levee approximately 7 feet or more in height may be appropriate, but would result in site drainage problems. Access would be limited during periods of flooding unless the access roads are raised. The flood risk to the Woodland site is substantially greater than for the proposed CPP. Elevating the plant on four to five feet of fill would protect against 100-year flooding, but there would continue to be a higher risk of damage by larger floods than for the CPP site.

The gas line would cross the man-made drainage channel west of the project site, but no other drainage features would be crossed by either of the linear features. Linear water resources impacts would be far less than for the proposed CPP.

Stormwater/Surface Water Quality

Stormwater impacts would be similar to those of the CPP. BMPs similar to those proposed for CPP would be required for stormwater quality. Water quality BMPs may include a detention basin. The basin would likely drain to the local drainage channel west of the site. Drainage into this channel discharges to Cache Creek, which eventually discharges into the Sacramento River.

Groundwater/Soils

Soils impacts are expected to be similar to those of the proposed CPP, with the exception of the linear features, for which the impact would be substantially less.

Sanitary wastes could be routed to the WPCF rather than into a leach field, resulting in less potential for groundwater contamination than for the proposed CPP. Linear features would be relatively short and have little potential to affect groundwater.

Water Use/Supply

The WPCF would supply all cooling and plant make-up water in the form of treated wastewater. This water source would be consistent with State Water Resources Control Board Resolution 75-58. The Woodland site would use reclaimed water, therefore resulting in fewer fresh water supply impacts than the proposed project.

NO PROJECT ALTERNATIVE

CEQA Guidelines state that “the purpose of describing and analyzing a No Project Alternative is to allow decision makers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project” (Cal. Code Regs., tit. §15126.6(i)). Toward that end, the No Project analysis considers “existing conditions” and “what would be reasonably expected to occur in the foreseeable future if the project were not approved…” (§15126.6(e)(2)).

The No Project Alternative assumes that the CPP project would not be constructed. As a result, the proposed site would remain, as annual grassland pasture, and the construction and operational impacts of the CPP would not occur. However, SMUD would not be able to make use of land and infrastructure that was originally set aside for the purpose of generating the power to meet the Sacramento area’s energy needs. The applicant would not meet the objectives of the project, which primarily are to provide energy to the Sacramento area. Consequently, SMUD customers would have less total generating capacity.

ALTERNATIVES ELIMINATED FROM DETAILED ANALYSIS

This section describes alternatives that did not satisfy the screening criteria for inclusion in the more detailed analysis presented above, and includes the following:

- Two alternative sites proposed by the applicant in the AFC (the Procter & Gamble site and the Campbell Soup site)
- Conservation and demand side management
- Distributed generation
- Renewable resources

Each of these alternatives, and the reasons for its not being considered in detail in this analysis, is addressed below.

SITE ALTERNATIVES ELIMINATED FROM THIS ANALYSIS

CEQA guidelines state that the alternatives discussion need not consider alternatives that are either infeasible, do not meet project objectives, or do not avoid significant environmental impacts. The following paragraphs describe two sites that were considered as alternatives to the CPP project and the reasons for their elimination from further consideration.

- **Procter & Gamble Site -** The Procter & Gamble site is located in the City of Sacramento, approximately 20 miles north of the proposed site. The site is bordered by the Procter & Gamble manufacturing plant to the south, the existing SMUD Cogeneration facility and peaking unit to the east, and the Union Pacific Railroad to the west. The applicant identified the Procter & Gamble site (Site 2) in the Alternatives section of the AFC (SMUD 2001a, p. 9-1). The site is vacant land, less than five acres in size, and zoned for industrial use. Both transmission capacity and gas supply are available; however, substantial upgrades to increase the capacity of these utilities would likely be required (SMUD 2001a, p. 9-4). This site was eliminated from the analysis because a five acre site is too small to support a 500 MW or 1,000 MW facility.
- **Campbell Soup Site -** The Campbell Soup site is located in the City of Sacramento, approximately 15 miles north of the proposed site. The alternative site is adjacent to the SMUD cogeneration facility on Franklin Boulevard and 47th Avenue. The applicant identified the Campbell Soup site (Site 3) in the Alternatives section of the AFC (SMUD 2001a, § 9). The site is less than 10 acres in size, is vacant, and is zoned for industrial use. Both transmission capacity and gas supply are available; however, substantial upgrades to increase the capacity of these utilities would likely be required (SMUD 2001a, page 9-4). This site was eliminated because from further analysis because a 10-acre site is too small to support a 500 MW or 1,000 MW facility.

TECHNOLOGY ALTERNATIVES

Conservation and Demand Side Management

One alternative to a power generation project could consist of a program or programs to reduce energy consumption. However, the Warren-Alquist Act specifically prohibits the

Energy Commission from considering conservation programs as alternatives to a proposed generation project (Pub. Resources Code, Section 25305(c)).
Despite the State's success in reducing demand in 2001 in response to power shortages, California continues to grow and overall demand is increasing. The 2002-2012 Electricity Outlook Report (CEC 2002a) concludes that, despite exceptional conservation efforts in 2001, demand will likely increase over time.

GENERATION TECHNOLOGY ALTERNATIVES

Staff considered several alternative generation technologies that do not burn fossil fuels: solar, wind, biomass, geothermal, and hydropower.

Solar Generation

Currently, there are two types of solar generation available: solar thermal power and photovoltaic (PV) power generation.

Solar thermal power generation uses high temperature solar collectors to convert the sun's radiation into heat energy, which is then used to run steam power systems. Solar thermal is suitable for distributed or centralized generation, but requires far more area than conventional plants. Solar parabolic trough systems, for instance, need approximately five acres to generate one MW.

Photovoltaic (PV) power generation uses special semiconductor panels to directly convert sunlight into electricity. Arrays built from the panels can be mounted on the ground or on buildings, where they can also serve as roofing material. Unless PV systems are constructed as integral parts of buildings, the most efficient PV systems require about four acres of ground area to generate one MW.

Solar resources would require large land areas in order to meet the project objective of generating 1,000 MW of electricity (or 500 MW for Phase 1 of the CPP). For example, assuming that a parabolic trough system was located in a maximum solar exposure area, such as in a desert region, generation of 1,000 MW would require 5,000 acres, or over 165 times the amount of land area required by the proposed plant and linear facilities. For 500 MW of output, these numbers would be reduced to 2,500 acres of land area, or about 83 times the land area required for the proposed CPP. For a PV plant, depending on the efficiency of the system, generation of 1,000 MW would require between 4,000 and 10,000 acres, or between 133 and 333 times the amount of land area required by the proposed plant and linear facilities. Land area for 500 MW of output would be between approximately 2,000 and 4,000 acres, or between 67 and 133 times the amount of land required by the proposed CPP.

While solar generation facilities do not generate problematic air emissions and have relatively low water requirements, there are other potential impacts associated with their use. Construction of solar thermal plants lead to potential habitat destruction. PV systems can have negative visual impacts, especially if ground-mounted. Furthermore, the manufacturing of PV panels generates some hazardous wastes.

Both solar thermal and PV facilities generate power during peak usage periods since they collect the sun's radiation during daylight hours. However, even though the use of

solar technology may be appropriate for some peaker plants, solar energy technologies do not provide electricity on a constant basis. Therefore, solar generation technology would not meet the project's goals, which is to provide baseload electricity to SMUD's service area.

Wind Generation

Wind carries kinetic energy that can be utilized to spin the blades of a wind turbine rotor and an electrical generator, which then feeds alternating current (AC) into the utility grid. Most state-of-the-art wind turbines operating today convert 35 to 40 percent of the wind's kinetic energy into electricity. Modern wind turbines represent viable alternatives to large power fossil-fueled power plants as well as to small-scale distributed systems. The range of capacity for an individual wind turbine farm today ranges from 400 watts up to 3.6 MW. California's 1,700 MW of wind power represents 1.5 percent of the State's electrical capacity.
Although air emissions are significantly reduced or eliminated with wind facilities, they can have significant visual effects and wind turbines also cause bird mortality resulting from collision with rotating blades.

Wind resources would require large land areas in order to generate 1,000 MW of electricity. Depending on the size of the wind turbines, wind generation "farms" generally require between five and 17 acres to generate one megawatt (resulting in the need for between 5,000 and 17,000 acres to generate 1,000 MW, or 2,500 and 8,500 acres to generate 500 MW) (CEC 2001b). Although 7,000 MW of new power wind capacity could cost-effectively be added to California's power supply, the lack of available transmission access is an important barrier to wind power development (Beck 2001). California has a diversity of existing and potential wind resource regions that are near load centers such as San Francisco, Los Angeles, San Diego, and Sacramento (CEC 2001c). However, wind energy technologies cannot provide reliably available power for peak demand due to the natural intermittent availability of wind resources, and therefore would not successfully meet the project objectives of providing electricity during peak demand.

Biomass Generation

Biomass generation uses a waste vegetation fuel source such as wood chips (the preferred source) or agricultural waste. The fuel is burned to generate steam. Biomass facilities generate substantially greater quantities of air pollutant emissions than natural gas burning facilities. In addition, biomass plants are typically sized to generate less than 20 MW, which is substantially less than the capacity of the proposed 500 MW or 1,000 MW CPP project. At the peak of biomass industry from 1990 to 1993, 66 biomass plants were in operation in California. Currently, there are about 30 biomass facilities in operation (CEC 2001d).

In order to generate 1,000 MW, fifty 20 MW biomass facilities would be required or twenty-five 20 MW biomass facilities to generate 500 MW. However, these power plants would have potentially significant environmental impacts of their own, such as the emission of significant quantities of air pollutants and emissions.

Geothermal

Geothermal technologies use steam or high-temperature water (HTW) obtained from naturally occurring geothermal reservoirs to drive steam turbine/generators. There are vapor-dominated resources (dry, super-heated steam) and liquid-dominated resources where various techniques are utilized to extract energy from the HTW. Geothermal is a commercially available technology, but it is limited to areas where geologic conditions result in high subsurface temperatures. Although geothermal resources do exist in California, there are no viable geothermal resources in the Sacramento County region (CEC 2001e).

Hydropower

While hydropower does not require burning fossil fuels and may be available to the Sacramento region, this power source can cause significant environmental impacts, primarily due to the inundation of many acres of potentially valuable habitat and the interference with fish movements during their life cycles. As a result of these impacts, it is extremely unlikely that new hydropower facilities could be developed and permitted in the Sacramento region.

Conclusion Regarding Alternative Technologies

The alternative technologies discussed above have the advantage of no fossil fuel combustion and avoidance of the environmental and resource impacts associated with it. However, these technologies also have the potential to cause significant land use, biological, cultural resource, and visual impacts, and they have substantial cost and regulatory approval requirements before they can provide substantial amounts of power. In summary, staff has eliminated these alternatives because (a) they cannot feasibly meet project objectives, and (b) they have the potential to create potentially significant environmental effects of their own.

RESPONSE TO AGENCY AND PUBLIC COMMENTS

KF-11 The AFC describes the project as a 1,000 MW facility, Phase 1 of which entails the construction of a 500 MW power plant. Phase 2, construction of an additional 500 MW section of the power plant, may or may not be constructed. Ms. French expresses concern that staff have not fully analyzed alternative sites for both a 500 MW and a 1,000 MW facility that could reduce the environmental impacts of the project at the CPP site.

> Response: As shown in the analyses above, staff have evaluated alternative sites for their ability to support either a 500 MW or 1,000 MW power plant. For sites which meet the project objectives and screening criteria, staff evaluated the following issue areas because of the potential for significant impacts from power plants: air quality, biological resources, cultural resources, noise, transmission system engineering, visual resources, and water resources.

CONCLUSIONS

Staff does not believe that alternative technologies (geothermal, solar, wind, biomass, and hydroelectric) are feasible alternatives to a 500 MW or 1,000 MW power plant.

While the No Project Alternative would eliminate all impacts of this project, the objective of increasing SMUD baseload and peaking generation in the Sacramento region would not be achieved.

Alternatives Table 1 following this section summarizes the major issues and concerns regarding the three alternative sites in comparison to those at the proposed CPP site. Where infrastructure connections (e.g., new gas pipelines, transmission lines, water lines, or roads) are required to be constructed, the impacts associated with their construction and operation are also considered.

Overall, the three alternative sites considered in this section offer some advantages and disadvantages in comparison to the proposed project. However, none of the alternative sites appear to reduce the potentially significant adverse impacts of the project. It should be noted that all potentially significant impacts of the proposed CPP can be mitigated to less than significant levels.
All three alternative sites are located adjacent to wastewater treatment facilities that can provide recycled water to the plant and minimize linear water supply impacts to biological and cultural resources. The use of recycled water would eliminate the use of fresh inland water from the Folsom-South Canal. In addition, the sites are located within close proximity to existing and accessible natural gas pipelines. Relatively nearby natural gas sources would eliminate the need to construct the new, 26-mile natural gas pipeline associated with the CPP site, which in turn would also reduce the biological and cultural resource impacts. All three of the alternative sites are located on already disturbed lands or historically flooded areas, further reducing the chance of disturbing cultural or biological resources. However, the Carson Ice-Generation site is within the Bufferlands of the SRCSD, which consists of 2,500 acres of wetlands, grasslands, and riparian forest habitats. The Bufferlands offers habitat for a variety of threatened- and special-status species, some of which may exist on the Carson Ice-Generation site.

In addition, the alternative sites would all be subject to greater flood-related impacts due to their locations within 100-year floodplains. The Carson Ice-Generation site would require the construction of additional 230 kV transmission lines for a 1,000 MW plant and switching stations to connect with the SMUD system. The Woodland site would also require new lines for either a 500 MW or 1,000 MW plant. The Lodi site would also require the construction of a new switching station.

The Lodi site is the most isolated, followed by the Woodland site, and the Carson Ice-Generation site. Both the Woodland and Carson Ice-Generation sites have sensitive receptors within approximately one mile. The Carson-Ice Generation site and the Woodland site both have potentially significant visual resource impacts as a result of the new overhead transmission lines**.** Depending on successful implementation of mitigation, a project facility at the Lodi and Woodland sites may also result in significant visual impacts from the power plant facility. Visible plume impacts at all three sites would be similar to those at the proposed CPP. Therefore, given that there are no significant unavoidable impacts from the CPP and each of the alternative sites has the potential for significant impacts, none of the three alternative sites is preferred over the CPP.

Alternatives Table 1
Comparison of Alternative Sites

Issues/Impacts	Carson Ice-Generation Site Alternative	Lodi Site Alternative	Woodland Site Alternative
500 MW Power Plant (Phase 1)			
Preliminary Comparison to Proposed CPP	Potentially worse	Potentially worse	Potentially worse
Major concerns or benefits	Potentially significant visual impacts Less freshwater use Land use inconsistencies as part of SRCSD's Bufferlands	Potentially significant visual impacts Less freshwater use	Potentially significant visual impacts Less freshwater use
Air Quality	Similar to CPP; SMAQMD requirements would likely mitigate impacts	Similar to 500 MW CPP, SMAQMD requirements would likely mitigate impacts	Similar to 500 MW CPP, YSAQMD requirements would likely mitigate impacts
Biological Resources	Fewer impacts than CPP because of shorter linear requirements and disturbed site	Fewer impacts than CPP because of shorter linear requirements and disturbed site	Fewer impacts than CPP because permanent disturbed habitat is less
Cultural Resources	Similar high potential for encountering archaeological resources	Unlikely to encounter archaeological resources because disturbed and in floodplain	Unlikely to encounter archaeological resources because disturbed and in floodplain
Noise	Fewer impacts than CPP due to greater ambient noise	Fewer impacts than CPP due to greater ambient noise	Fewer impacts than CPP due to greater ambient noise
Transmission System Engineering	Similar to CPP	Requires coordination with PG&E or WAPA and ISO	Greater impacts than CPP; a new 230 kV line; requires coordination with PG&E and CAISO if connect to Table Mountain-Tesla 500 kV line
Visual Resources	Greater and unmitigable significant visual impacts from the 230 kV transmission line required by 1000 MW facility	Greater and potentially significant impacts from the power generation facility's plume	Greater and unmitigable significant impacts from all project structures
Water and Soil Resources	Fewer linear impacts due to distance to water supply, but greater flood related impacts. All other impacts would be similar.	Fewer linear impacts due to distance to water supply, but greater flood related impacts. All other impacts would be similar.	Fewer linear impacts due to distance to water supply, but greater flood related impacts. All other impacts would be similar.
1,000 MW Power Plant (Phase 2)			
Preliminary Comparison to Proposed at CPP	Potentially worse	Potentially worse	Potentially worse
Major concerns or benefits	Potentially significant visual impacts Less freshwater use Land use inconsistencies as part of SRWTP's Bufferlands	Potentially significant visual impacts Less freshwater use	Potentially significant visual impacts Less freshwater use
Air Quality	Similar to CPP; SMAQMD requirements would likely mitigate impacts	Similar to CPP, SMAQMD requirements would likely mitigate impacts	Similar to CPP, YSAQMD requirements would likely mitigate impacts

Issues/Impacts	Carson Ice-Generation Site Alternative	Lodi Site Alternative	Woodland Site Alternative
Biological Resources	Fewer impacts than CPP because of shorter linear requirements and disturbed site though greater than for 500 MW because of the transmission line construction	Fewer impacts than CPP because of shorter linear requirements and disturbed site	Fewer impacts than CPP, but greater than for a 500 MW plant because of the need for additional linears
Cultural Resources	Similar high potential for encountering archaeological resources, greater than for 500 MW because of transmission line construction	Unlikely to encounter archaeological resources so less impacts than the CPP	Unlikely to encounter archaeological resources so less impacts than the CPP
Noise	Fewer impacts than CPP due to greater ambient noise	Fewer impacts than CPP due to greater ambient noise	Fewer impacts than CPP due to greater ambient noise
Transmission System Engineering	Greater impacts than CPP; a new 230 kV line switching station would need to be constructed	Greater impacts than CPP; would need to build a switching station	Greater impacts than CPP; would need to build a 230 kV line and potential issues dealing with PG&E and CAISO if connect to Table Mountain-Tesla 500 kV line
Visual Resources	Greater and unmitigable significant visual impacts from the 230 kV transmission line	Greater and potentially significant impacts from the power generation facility	Greater and unmitigable significant impacts from all project structures
Water and Soil Resources	Fewer linear impacts due to distance to water supply, but greater flood related impacts. All other impacts would be similar.	Fewer linear impacts due to distance to water supply, but greater flood related impacts. All other impacts would be similar.	Fewer linear impacts due to distance to water supply, but greater flood related impacts. All other impacts would be similar.

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Inserts:

Alternatives - Figure 1 (Carson Ice-Generation Site 500 MW Option),
Alternatives - Figure 2 (Carson Ice-Generation Site 1,000 MW Option),
Alternatives - Figure 3 (Lodi Site 500 MW and 1,000 MW Options),
Alternatives - Figure 4 (Woodland Site 500 MW and 1,000 MW Options),
Alternatives – Figure 5 (Visual Figure)
Alternatives – Figure 6 (Visual Figure)
Alternatives – Figure 7 (Visual Figure)
Alternatives – Figure 8 (Visual Figure)
Alternatives – Figure 9 (Visual Figure)